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MY BIRTH

THE AUTOBIOGRAPHY OF AN UNBORN INFANT

BY

ARMENOUHIE T. LAMSON

New York
THE MACMILLAN COMPANY
1916

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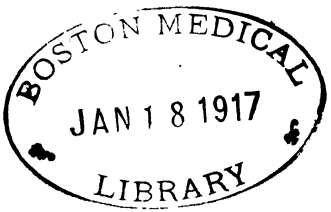

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To

MY LITTLE ONE IN THE BEING

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PREFACE

In response to the urgent need of the present youth for true knowledge concerning motherhood and the prenatal life of a babe this daring narrative was undertaken.

With austere courage the little yet unborn being tells through its mother in the language of Everywoman and Everyman how it came into being and how in the nine months before birth its various organs unfolded from the one original cell. In describing their development it tells of a few fundamental facts concerning their complicated mechanism and the part they play in the act of living and does not hesitate to criticize their use and abuse by the present generation.

Before telling of the actual act of being born, it makes a final appeal to young mothers not to allow commercialized fashion and fad to penetrate the peacefulness of infancy and early childhood and hinder the normal development of a tender body, mind and soul. In order to dispel the

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harmful influence of superstitious stories on an expectant mother, this little one tells how in the light of most up-to-date science it escapes various body deformities (birthmarks) and how probably the mysterious question of its sex is determined.

That this modest book may be of some assistance to young mothers and teachers who are more often confronted by young boys and young girls, who, prompted by newly awakened sex consciousness, ask, "How did I come to be?" is the sincere wish of the author and mother. For their thorough understanding and for their use a number of illustrations taken from the most authoritative sources are inserted.

The little autobiographer yet in the being and I, its mother, herewith wish to extend our most sincere thanks and appreciations to all those scientists, embryologists and anatomists on whose observations is based this strange biography which ends where all others begin.

A. T. L.

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BOSTON MEDICAL
JAN 12 1917

MY BIRTH

THE AUTOBIOGRAPHY OF AN UNBORN INFANT

FOREWORD BY THE MOTHER

SURELY it will not be amiss, perhaps it may even interest the reader to know, just how this strange autobiography came to be. Unlike other personal diaries, this one begins and ends before the birth of the autobiographer, who tells in simple form just how, when and where his little body came to be — how the different organs were constructed, equipped and finally each tuned to the life it will have to live in this world, when happily born.

It was in the fourth month of approaching motherhood when I felt the little guest move freely within the hidden chamber which was in me and part of me. At times it seemed as if its little legs, or perhaps its little hands,

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were gently knocking at the walls of its dwelling in an endeavor to wake up my soul from a dream it had been dreaming at least since my arrival at womanhood. Who knows! perhaps that wakeful dream had begun when I embraced my first doll.

Those mysterious jerky motions were the first communications I had received from that new life. Until then only annoying symptoms had told me of the great creative work God had so graciously begun in me. With that remarkable occurrence which is spoken of as "Quickening," my suspected baby became a reality. With each beat it seemed to gently approach the threshold of my soul, begging for free and frank communication and pleading for better understanding from me — its mother.

It seemed appalling that I was allowed to become a mother without knowing the meaning and significance of approaching motherhood. I am ashamed to confess that like most young mothers of my time, I was quite ignorant of the exact conditions under which this baby of mine was existing. I knew nothing of its daily life nor its needs. My knowl-

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edge of that great phenomenon — the birth of Man — was just as dim as that of my less educated ancestors. In fact, in my false modesty, I, like them, was proud of my ignorance.

As the days and wakeful nights passed, the mystery of that gentle throbbing within me, for which I had no satisfactory explanation, grew greater. Finally I was seized with an intense desire and determination to tear down all barriers of conventionality, of inherited superstition and prejudice, and henceforth seek openly true knowledge concerning the birth of my child.

I went to a few of my very intimate friends and advisers, but they, being also the products of the same farcical civilization, were unable to give me satisfying information.

The medical books which my doctor kindly brought to me contained many a lengthy discourse about the birth of Man, but their language was utterly foreign to me. Each paragraph was loaded with long scientific terms which I could hardly read. In no way did they help to quench my thirst for knowledge.

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Instead, I became more acutely conscious of my ignorance. With every new day I seemed to experience a new sensation, which I knew would thrill my blossoming mother-heart, if I could have responded with intelligent understanding.

Another little one was to be born into this world. I was to wait for it still five mysterious and perhaps dangerous months. But what was to happen in all that time? Was it true that the thoughts and actions of an expectant mother affect the progress, perhaps retard that great creative work? Was it a mere parasite, living on its mother, or was it already an independent being, endowed with all the attributes of life? These and many more questions, doubts, fears, hopes and longings seemed at times to overpower me.

One day in the peaceful silence of early dawn, it seemed as if I heard the insistent calling of my little infant. "Throb, throb," came just from under my heart. I closed my eyes to exclude all distractions from without and made a supreme effort to bring my soul within the reach of my child. Gradually there came to me from so near yet so far away, from

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the land of the unborn — sounds and words that echoed in my soul and finally reverberated into my mind, where they were assembled into such human thoughts:

"Why all this mystery about our existence, my mother-to-be? Why are we barred from the knowledge and conversation of every civilized man and woman when we do exist so actively in the mind of every thoughtful person, regardless of age, nationality and social standing? Deep in their souls they all are intensely interested in our development, in our place of habitation as well as in our mode of living. Still they pretend the contrary and dare only whisper about us in their most intimate circles.

"Why do fathers and mothers invent all sorts of most improbable stories about our coming? It has been said by them that we come from the mountains, or from the angry river fighting its way through the village. Some even venture to say that we come from the land unknown: from the stars. Others make their little ones believe that we are to be bought from the old family doctor, who has a large house full of little babies yet to be born. Even

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birds and beasts have been accused of being responsible for our sudden appearance.

"It seems as if every mother, who is questioned about our coming, invents a story of her own. Every country, every period of civilization, has brought forth a new tale about us, thus burying our existence before birth, as well as our birth, in falsehood and mystery.

"Let us tear away this cruel curtain of so-called modesty which benefits no one. It only breeds superstition and falsehood. Lend me for the time being your worldly tools of expression, and you and I, let us tell every girl and every boy, in their own words, that in future motherhood and fatherhood they are not only indispensable tools in the hands of the Creator, but also that all material to be used in the construction of the body of their child is supplied by them.

"Let us tell them how the new being, during the period of its creation, is tucked away in the softest and safest spot in the body of its mother — right under her throbbing heart, until the little one is fully equipped to meet all requirements of the complicated life it will have to live when born.

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"Could there be then such a crime as 'race suicide' or any other sin connected with manhood and womanhood if all young men and all young women were familiar with the true facts concerning fatherhood and motherhood; if they fully realized that every act of each day in their lives may add a straight or a crooked, a true or a false line to the moral pattern of that new life, which will come into being through them and in them? Let them know that *they are responsible for the life pattern of their offspring.*

"Think how much less would be the mental anguish and physical pain of a prospective mother if she knew something about the creative period of her babe. How patiently would she bear all discomfort of those trying nine months, if she could think of each particular week to be the time when a certain organ in her infant becomes a useful member of that great unit; when fingers are added to the hands, feet to the legs, and features to the face. Knowledge will fill every minute of that period with happiness and a peace that comes only from perfect understanding.

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"Later to them the birth of a child will not be a mysterious and unavoidable event, but it will mark the day of great joy, when through them the greatest of all miracles begins its second chapter — life in your world."

When I awoke from that remarkable dream I found myself in a different world. All the physical discomforts and mental anguish which had come with the beginning of my infant had disappeared. In my lonesomeness I had found the dearest companion, who was to be with me and in me night and day; whispering into my soul all that was taking place in him and about him.

In return I was to lend him my worldly tools of expression, writing down what I was inspired to learn during those early peaceful hours of the morning. This for the sake of all those mothers and fathers, maturing girls and boys, who are also anxious to know the truth about the birth of a child.

Hence this humble but daring narrative which is based on the most up-to-date theories regarding the birth of Man, but presented in the language of Everyman and Everywoman.

Whether you be a father or a mother, a

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friend or a teacher, I lay in your hands with this modest book its sacred object — take it and pass it on in its true holiness.

THE MOTHER AND AUTHOR,
ARMENOUHIE T. LAMSON.

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CHAPTER I

MY VERY BEGINNING

It was in the newest hours of a new day, when I promised to tell the old, old story of a new life, the story of the birth of Man — my birth — my story.

In spite of the fact that this story is the oldest story in the world, and every being through all ages has been himself or herself the hero or the heroine, I am told that only a few have heard it, and fewer yet are the brave ones who dare tell it.

Strangely, this ancient story has a still more ancient beginning, which lies away beyond time and memory. In fact its very beginning is so aged that it crumbles and falls to pieces when thought and logic try to place it into any one of the countless volumes of wisdom. Therefore, it has not been possible for the wise men of your world to permanently place it in any one of the popular ologies.

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Theology, physiology, zoölogy and geology, with the aid of chemistry and physics, each in turn is trying to claim the oldest beginning of a new life. I, too, am unable to trace it to its very source. Still I am anxious to answer the question in the mind of every modern mother and every thoughtful father which they ask in song, in jest and in solemn earnest, "Where did you come from, baby dear?"

If I must answer such a great question, I say, "I come from everywhere." Then all things of all times past have contributed towards my being. But life, or the ability to move, assimilate, grow and reproduce came to me from the very first organism which was endowed with such a life. Just how, when and where this first mother cell came to be, I confess with the wisest men of your world, "God only knows."

Hence I shall trace the very beginning of the story of my birth only to the very first living cell, when I was a minute germ-plasm within the body of that first being. My task was then to be and in time to carry on the torch of life to the coming generations. As

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such a life-carrier, or germ-plasm, I then wandered through all ages of evolution and in due time climbed all steps of civilization; gathering tendencies, characteristics, talents and abilities from the experiences of all my countless ancestors. Finally that day came when the great Creator found me sufficiently mobilized to fight my own battle of existence.

Therefore, when my mother was born, I was sent with her as one of her many ova or generative cells; to help her in time to reproduce her like; to add one more link to the great human chain which thus increasing and advancing is to return to God in Eternity.

Hence I have been with my mother at least since her birth, tucked away with 30,000 or 40,000 other ova in the softest and warmest niche in her body, which you call Ovary. Every woman possesses two such ovaries; one on each side of the Uterus — Womb. You see in Figure I how these two ovaries, little plum-like bodies about 1 and ½ inches in diameter, are wrapped and tucked away in the folds of the supporting tissues of the uterus — with which each ovary is connected by a narrow tubelike passage.

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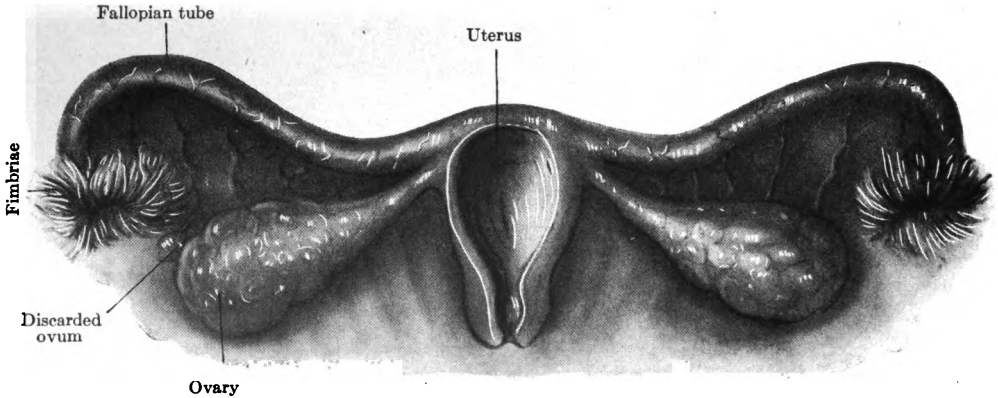

FIG. I. — FEMALE REPRODUCTIVE ORGANS. (Uterus diagrammatic and greatly reduced.)

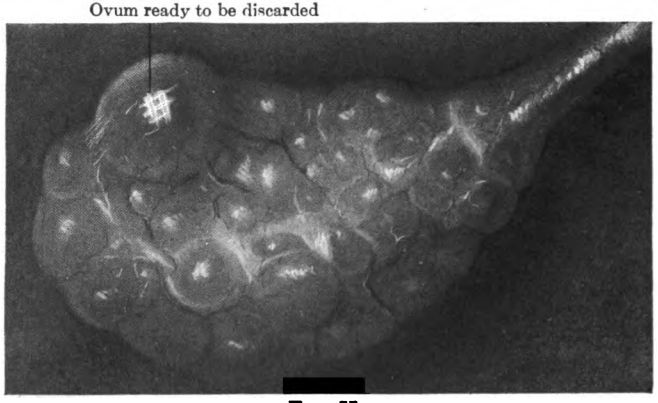

FIG. II.

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I happened to be then an ovum — or human egg — living in the right ovary, which is a trifle larger than the left one. About 40,000 little ova were my companions. At first we were all comfortably housed around the periphery of the ovary — doing little active work. Some even seemed to be slumbering. Day after day, and month after month would pass without my noticing any changes among them.

One day, almost tired of waiting, I inquired for the reason of our inactivity. I was told that our turn for action would only come when all the other organs in the body of our child-mother had sufficiently developed to stand the additional work they will have to do for our maturation.

Most people, who know little about the human generative cells, accuse them of leading a parasitic life — just living on the mother without taking any part in the growth of her body nor sharing the task of her daily living. Such an accusation is not quite fair to the little eggs, because in their time theirs is the great calling to be and to help perpetuate the race.

They are in the true sense of the word life-

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carriers, and as such they know no death. While the somatic cells, which build up the body and help the different organs to functionate, die with the host and return to dust, generative cells — the ova — may pass on to the coming generation and thus live on to Eternity.

What a great pity, then, that so few of these precious life-carriers get an opportunity to fulfill their great calling. When I am born, I shall surely try and find out why this should be so. Is it true that selfish economic factors force man to forcefully cut down our birth rate and deprive us of our birth-right — to be and to bear?

From the many thousand ova in every woman, at least two hundred mature and are equipped to assist in the birth of a new being, but how few are finally chosen for that glorious function! You can perhaps understand, therefore, the intense excitement among us when the monthly cycle would come around, when some of the mature ova would be taken away so that they might have a chance to live on. Under such circumstances waiting was for us very trying at times.

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When our child-mother was about ten years of age, some of the more matronly looking ova among us were ordered to withdraw toward the center of the ovary, where everything could be done more conveniently for their rapid growth and development. There was ample space for expansion there and plenty of blood vessels to provide them with all the elements necessary for their maturation.

As all maturing ova are veiled or enveloped in what the scientists of your world call "Graafian follicle," we waiting ones could not see very plainly the great things which were happening within. Something most remarkable was surely going on, because all efforts seemed to be directed toward the center, all the larger blood vessels were swollen to their utmost capacity, taking great volumes of blood back and forth. Even the nerve channels showed the marks of overwork. Under such excellent care, one could almost see them grow and develop.

Those who were ready or sufficiently matured were then rolled away from the center, back to the periphery. We used to speak of their "coming out party"; matured, veiled,

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puffed and lady-like they rolled about, pushing the little slumbering sister cells away and pressing themselves forward against the very outer wall. Finally the outer envelope — Graafian follicle — not being able to stand the pressure from within, would break, and our proud and mature sister would end her coming out party with a complete going out.

I do hope that in your world the coming out party of an older sister is not so much at the expense of the younger sisters. One never saw or heard again of a sister ovum who in this manner had left her cozy and comfortable home — the ovary. This maturing and parting incident of an ovum is called "Ovulation" by you. To us it means either death or the beginning of a new life.

In order not to break the law and the rule of nature we were kept busy watching, sometimes helping in the ovulation of some among us, — an incident which took place at regular monthly intervals. The torn walls, through which the mature ovum had escaped, had hardly been mended when we were asked to assist other ripe ova to break a similar outlet and depart.

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Twenty-two years at least I had been waiting patiently for my turn to come. I had gladly and willingly assisted many others to mature and to depart — in the meantime not neglecting my own preparedness.

At last I was called upon to depart. In spite of the fact that I had to leave my warm dwelling place in the ovary for a mysterious future holding more possibilities for death than a new life, I was bubbling with happiness and gratitude to be finally given a chance.

However, before my departure I was ordered to proceed to the "mobilization camp" at the center of the ovary, where I was looked over more thoroughly and further equipped with the necessary elements for the performance of my great task.

Hardly had I arrived at this center of activity when a great number of blood vessels and nerve fibers entered into me, zealous to have me take from every one as much as each one could give. Of course we little delicate ova, who were at this remarkable mobilization camp, could not use all that was offered to us. Therefore, at times there was serious trouble about us — "congestion" — they called it.

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We all regretted such a condition. Congestion in the ovary invariably causes painful sensations to our mother, who has to suffer during each monthly cycle just on our account, until the congestion among us is relieved.

I hope an explanation of this phenomenon will make women more patient to bear the pains and inconveniences during such periods.

Personally I did not suffer seriously during that incident. In spite of it all I rapidly grew in size. This perhaps was mostly due to the increase of fluid within the outer envelope of my body — the ovum.

One morning, however, I noticed that the elements within me were dividing in two halves. The other half of me did not develop into a new cell — a daughter cell — but it perished.

At first I was in despair, thinking of the sudden departure of all the wonderful characteristics, talents and virtues which I had collected on my perilous journey down the countless past ages and up the steep slopes of evolution and civilization.

But in spite of the fact that I had lost half of my contents, I was still outwardly growing

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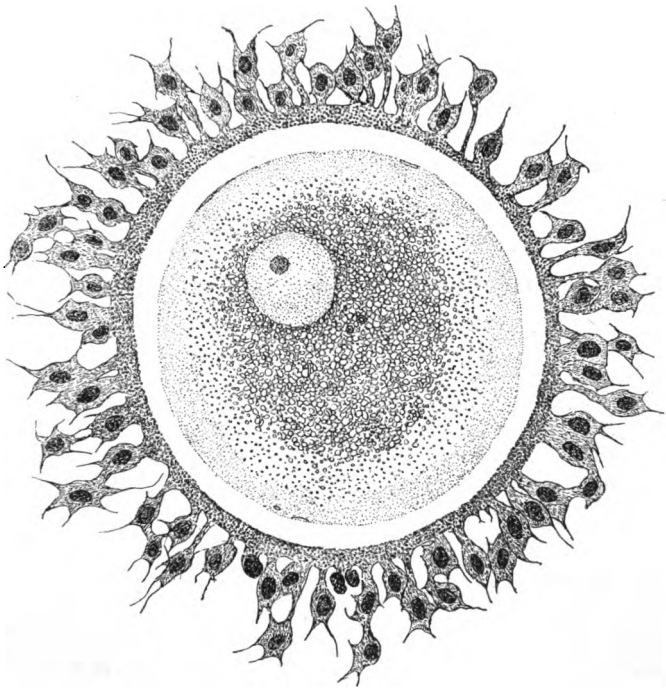

FIG. III. — DIAGRAM OF HUMAN OVUM. (Waldeyer.)

FIG. IV. — DIAGRAM OF HUMAN SPERMATOZOON. (Retzius.)

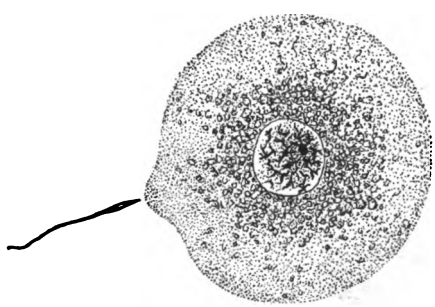

FIG. V. — OVUM READY FOR RECEPTION OF SPERMATOZOON. (After Cunningham.)

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in size. Evidently I was losing in quality when gaining in quantity. My neighbors, the other numerous little ova, soon began to resent my sudden growth and commenced to push me back closer and closer against the outer wall of the ovary, until I seemed to be literally bulging out like a little blister. Figure II will show you just what an uncomfortable position I was thus forced to take. However, it was not long before the last act of ovulation took place. The outer wall of the ovary, as well as my protecting membrane — "Graafian follicle" — broke, and I was discarded.

The fluid that had been collected within my outer covering now escaped, washing me out of my cozy home. As I had no means of self-locomotion, I was entirely at the mercy of the elements about me in the lower abdominal cavity, where it was dark and all quiet, except for the mysterious gurgling within the intestines.

Fortunately I soon noticed above me little tentacle-like projections—"Fimbriæ" — which were waving at me, as if beckoning me to come. Hardly had I time to decide for myself which way to turn, when a wave came

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and I was pushed in or sucked in by these tentacles.

When I recovered from the shock of such a sudden and forceful transportation, I found myself in a narrow tubelike passage, called "Fallopian tube." As it was very dark and very close about me, I was sure my end was at hand. But then a great miracle took place. *I suddenly felt myself forcefully held and lovingly embraced by a friendly little stranger known as the male germ cell or "Spermatozoon"* — during which act the male element disappeared within my body.

Unfortunately there was hardly time to follow the details of this great miracle. It seemed as if all came and passed in an instant. The two cells met, and uniting, amalgamated into one great unit.

I am afraid no one but God knows just how the complete union and blending into each other of the two elements, the female generative cell — the ovum — and the male generative cell — the spermatozoon — takes place. Scientists of your world only know that when this act of fertilization occurs, it marks the very beginning of a new life, which, in its time,

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like the mother being, will be capable of moving, growing, assimilating and reproducing its like.

Such is the true and romantic birth or beginning of every human being. No one but God and my parents are responsible for my coming. I am so happy to think that the true story of my birth has nothing to do with the popular stork story, where the stork is charged with stealing the little baby from some one or somewhere to sell it to a mother. I was neither stolen nor forcefully taken away from anywhere. *But I am proud to be the free gift of my mother and my father.*

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CHAPTER II

THE PATTERN OF MY FUTURE SELF

SURELY that was the greatest day in my life, the day which rightfully ought to be remembered as my birthday. On that day of all days the greatest miracle in my life took place, when the two primary elements — the spermatozoon and the ovum — met, and uniting, gave a new life to a stray little ovum whose days were numbered in a single file.

If this great incident had not taken place, I would have perished in the surrounding foreign elements within a few days, perhaps in a few hours, just like many of my sister ova, who had left the ovary before me. Instead, through the kind act of the male element, I was given a new life to live in your world of experiences, hopes and opportunities.

In the act of fertilization of the ovum a marvelous human body with all its complex organisms was called into being. The character of its species, sex and appearance was decided

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upon, and the corner stone of its mental, moral and emotional life was laid. Unfortunately it is beyond our comprehension and understanding how a mere meeting and uniting of two single cells can have such miraculous consequences.

A closer inspection of the two fundamental cells may somewhat help you picture how the wonder pattern of my future life was drawn.

The female sex cell — the ovum — and the male sex cell — the spermatozoon — equally share the great task of the propagation of the species. Both are single cells of extreme minuteness. A mature ovum is not larger than 0.25 mm. in diameter, while the spermatozoon measures 0.05 mm., only $\frac{1}{5}$ as large as an average ripe ovum. Still both contain all the vital elements which you find in an ordinary egg of a bird.

In the center, buried in the yolk — germinal vesicle — is a little dense spot — germinal spot — which is often called the "Nucleolus" or the soul of the cell. This dense spot must be the most vital structure in a cell, because when it is harmed by unfriendly elements,

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gradually the whole cell shrinks, withers and is washed away as waste. When the nucleolus divides itself the whole cell follows its example. Through such complete division often a new cell similar to the original one is created. The new cell is then called a "daughter cell."

The main body of the cell — the yolk or "Nucleus" — is filled with a dense network supporting little particles or granules. Scientists, who stain these granules to make them visible, call them "chromatin (color) granules" or "chromosomes."

Unlike the egg of a bird, the ovum is enveloped by a delicate soft membrane instead of the shell. Little channels are to be found penetrating this outer covering which bring to the cell the nutriment gathered by the helping cells surrounding each ovum. It is a fact that these helping cells — follicle cells — contribute materially toward the growth and development of each ovum. Figure III.

It will be ungrateful for me to say just which structure of the ovum is the most important. Each has a duty which could not be performed by the other. Without the aid of any one the whole could not exist.

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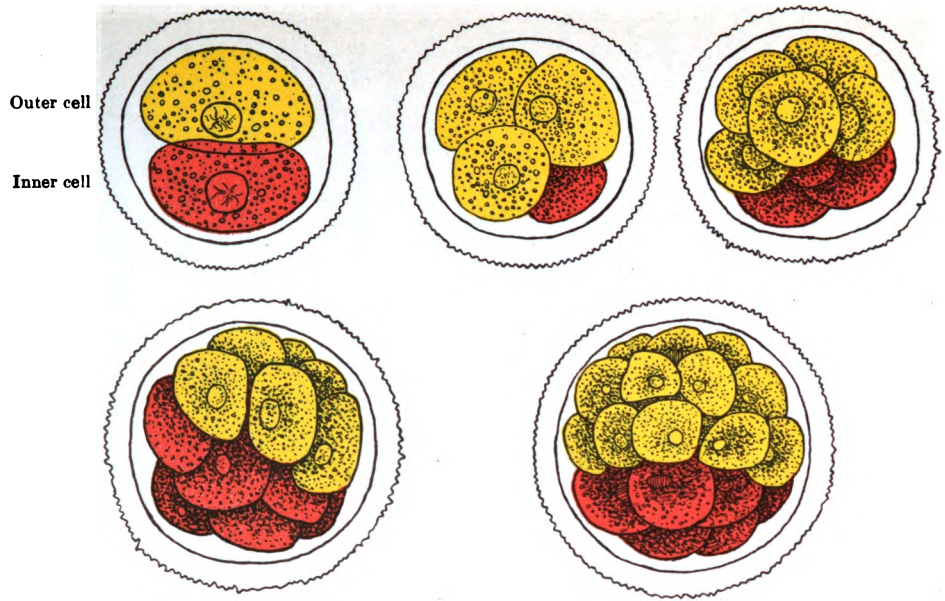

FIG. VI. — DIAGRAM SHOWING FIRST STEPS IN SEGMENTATION OF THE OVUM. (von Beneden.)

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The spermatozoon greatly differs in its outward appearance from all the other cells of the body; perhaps on account of its thread-like tail which keeps the whole in active movement. Figure IV.

That was the reason I was so frightened when in my hour of distress in the dark narrow Fallopian tube, I first saw that strange being. (I am not surprised to hear that until very recently spermatozoa were regarded as little living animals.)

However, it soon won my confidence through its kindly act, and when I had sufficiently recovered from the unexpected occurrence, I looked it over more closely. Its oval shaped head seemed to contain all the vital elements of a cell. Even color granules or chromosomes were present in full force.

From the apex of the head projected a spear-like process which was both sharp and hooked, evidently made to pierce an opening, and when successful on account of the hook, it could not be forced back.

The tail interested me most because it was different from what I had seen before. Besides, it was moving all the time. A spiral

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membrane as delicate as the most delicate membranes of a fish was attached all along to the body of the tail, evidently to help in its propelling and guiding movements.

As the tail moved, the whole cell came forward. It was plainly to be seen that this happy being had an innate power of self-locomotion. It seemed to be able to go wherever an inner desire, call it "Instinct," ordered it to go. It was even capable of swimming upward against the strong current which was present in the dark Fallopian passage.

When this strange spermatozoon approached me, it seemed as if it was attracted by some element within my own self, located perhaps in a certain portion near my outer wall. The spermatozoon swam all around me as though looking for that one spot. Finding that center of attraction, it stopped, embracing me, pierced its weapon of entrance, the spear, into that portion of my body, and with a boring motion advanced into the innermost of my being — the nucleolus.

Do you think it possible that some magnetic power within me attracted this foreign element and then like a magnet pulled it in? If you

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study Figure V, you will see that a certain portion of an ovum at this stage is bulging forward, as if eagerly waiting for the entrance of its savior — the spermatozoon.

When the two elements met, the spermatozoon entered and disappeared within my body — the ovum. Strange to say, in this act the fascinating tail somehow disappeared. Whether it was willingly discarded or it was accidentally or intentionally broken off, I don't know. I only noticed that, when the head of the spermatozoon entered the nucleolus of the ovum, it was minus the interesting tail.

A remarkable incident followed the act of fertilization. As soon as the germinal spots of both cells met, they were fused into one. Even the mature chromatin granules of each cell joined forces to decide the life and the appearance of the future being — myself after birth.

I was intensely interested to hear that the chromatin granules of both cells brought the pattern of my future life. They were the bearers of all the qualities, good and bad, which I was to inherit from my parents and their ancestors.

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Naturally you might think that the number of the chromosomes or hereditary granules in the fertilized ovum are twice as many as they are in each of the original cells. Such a multiplication of hereditary qualities is fortunately prevented by a process of maturation which takes place both in the ovum and the spermatozoon before the act of fertilization.

According to a great scientist of your world, the female sexual cell originally contains 48 such chromosomes, while the spermatozoon contains 47. During maturation the cell contents of both are divided in two, and one half is lost. Hence the fertilized ovum receives in addition to her 24, either 23 or 24 from the male sexual cell. Thus it is that the fertilized ovum is not essentially larger than the single mature ovum.

Fortunately during maturation the stronger hereditary qualities in each of the cells are retained, while the weaker ones perish. Evidently that great law, "survival of the fittest," also governs this first battle of life. Hence during my fertilization only the victors met, and uniting, made the pattern of my future self.

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It has been said that hereditary characters fall into two opposite groups which alternate with or supplement each other. For instance, the ovum as well as the spermatozoon is said to possess a pair of chromosomes which contain either both black, or the one blue and the other black, eyed tendencies. During maturation the weaker of these chromosomes perish, so that in the act of fertilization there are only two instead of four such tendencies to form a favorable combination. In my case, if the blue-eyed tendency was retained during maturation and fertilization, I am sure to have blue eyes when I am born. If during this act of union the black-eyed tendency was the stronger in both cells my future eyes will surely be black or at least dark.

The same rule may apply to the formation of my moral characteristics. However, their development will depend greatly on my future environment and bringing up. I will bring to your world only the inborn ability to judge and to choose between the good and the bad which you call "Instinct." Instinctively I may want to be good or bad, useful or harmful.

Among the great number of chromosomes

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which came to me, some brought to me also talents, inborn likings, or mental tendencies. When any one of these is recognized early and stimulated by adequate environment, and properly trained, it might become a real talent. If such a talent is then developed to its utmost creative possibility, I may have the good fortune to be known as a "genius" in that particular line.

However, it may also be possible that the good and useful talent granules were not strong enough to survive the act of maturation and fertilization. Then I am sure to grow up to be one of the great multitude of mediocres, who, I hear, struggle desperately to even make a living in your world. Even so my fate will not be as pitiful as that of a great many human parasites who crowd your public and charitable institutions.

After such reflections it is a comfort to me to know that my near and remote ancestors are the ones who gave me all my physical, mental and moral characteristics. And through their good and honest living my mind as well as my soul are sensitized to respond to the best and accept only the good in life, wherever

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and whenever they may cross my path. It comforts me to believe that environment, education and training can somewhat supplement the good I did not inherit and can correct some of the undesirable lines in the inherited pattern of my life or at least they can assist in the final modeling of my soul.

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CHAPTER III

RECRUITING AND ORGANIZING OF WORKERS

In spite of the fact that I am yet a no one, I feel like a real hero, who is said to be one before he is dead and gone. I am proud of myself, because I know it was most daring to speak of that miracle which made my birth a possibility. Now that I have given away the greatest secret in the life of man, which unlike other secrets is seldom told, I wonder again why the episode, which tells of the beginning of man, is barred from the conversation of all so-called "good people."

No part of the story of my birth thrills my heart more than that which tells of the heroic act of the spermatozoon — how it saved the wandering ovum from destruction and death. I know of no greater wonder than the union and amalgamation of these two friendly cells, which gave birth to a new life equipped with a definite and individual pattern unlike any other in the whole universe.

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At first the fertilized ovum showed no external signs of being affected by that most extraordinary experience. The coming of the male element did not even increase its size, as one would have expected. This surely was due to the fact that each participant during its maturation, which preceded the act of fertilization, had lost half of its chromosomes. Therefore, the result of the union of the two cells was again only one complete cell of the usual size.

But how different were the conditions within the new cell from that of the original ovum! It was all motion. Driven by a new life, each particle seemed to obey some innate power, fulfilling the great law of the universe, which had come into effect during the vast ages of time, through the living of each generation.

By and by, the compound nucleolus of the fertilized cell swelled again and divided itself. The nucleus as ever followed suit, and before the first hour was over each half developed into a separate and complete cell — just like the formation of daughter cells. Hence two cells came to be within the one original ovum.

Hardly had the outer delicate membranous

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wall adjusted itself to the two new tenants when the two units also got busy and divided themselves, giving birth to four cells.

Such a division or "segmentation" continued until there were as many as thirty-two cells in the one fertilized ovum. Thus the immediate result of fertilization of the ovum was segmentation, when the principal workers were created. They also began to increase rapidly, and it became necessary to organize this new colony of cells by first dividing the mass into two main groups. Those nearest the outer wall, at the periphery, remained where they were, while the others were asked to group themselves closer into a separate cluster — "Blastula" — which is often and justly called "Morula" (mulberry mass).

I do not wish to give you the impression that this recruiting and dividing of working forces were done thoughtlessly in a haphazard manner. From the very beginning one great Godly power was directing all movements and acts of each cell and each granule.

During segmentation two kinds of cells of equal number were created as you see in Figure VI. Each newly formed cell knew for

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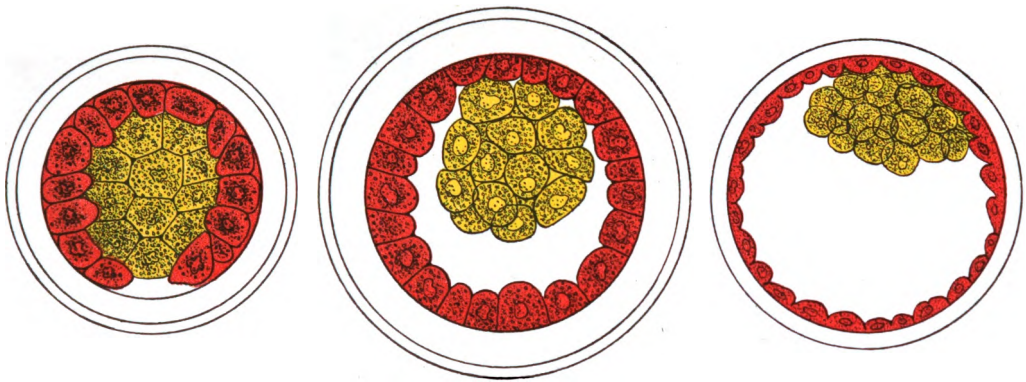

FIG. VII. — DIAGRAM SHOWING FORMATION OF MORULA OR BLASTULA. (von Beneden.)

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what purpose it came to be. Therefore, when the time and orders for organization and separation came, no time and energy were wasted. In a little while each cell was able to take its particular position.

The cells of the blastula proceeded toward the periphery and attached themselves at one point. Shrinking they also created a free space within the main body, called Blastodermic vesicle. This cavity was the very beginning of my future digestive tube or primitive gut.

When this process of "Gastrulation" was over, it did seem as if this empty space or so-called "stomach" was the largest part of my being. Therefore, I don't blame the people of your world for giving me at this stage of my development the nickname of "Gastrula" (little stomach). Figure VII.

The next step these little cells of the blastula took was to organize their working force. The outer cells called themselves Ectoderm (outer layer), and went to work in their own way to form the necessary protective bags as well as to lay the foundation of the marvelous future protective mechanism,—the nervous system of my body.

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The inner cells did not waste a second's time. They also increased and called themselves Entoderm (inner layer), and remained grouped together, forming a flattened polygonal plate, from which gradually were molded many of the most important organs of nutrition. For instance, the primitive digestive tube and later the various organs of digestion are of entodermic origin.

While the Ectoderm and Entoderm were doing such great things, a new layer of cells appeared in between the two and called itself Mesoderm (intermediate cell mass). It might be possible that this new battalion came to be by the separation of some cells of the Ectoderm, recruiting others which were not needed by the Entoderm.

Thus the working forces of this new party also increased rapidly and began to take a very important part in the inner construction of my body. In fact the number of the cells of the Mesoderm grew so large that they were also forced to divide their forces into two layers but kept the two ends united. In that way a cavity was formed between these two groups or layers of cells — that was the be-

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ginning of the body cavity in which later all the organs of respiration, digestion and elimination were placed.

In this simple but thoughtful manner the countless workers were created or recruited, and each was equipped with certain definite building elements as well as with the necessary force. The whole army of workers was organized. Each unit received a definite task to perform at a given time.

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CHAPTER IV

HOW THE FOUNDATION OF MY BODY WAS LAID

WITHIN a few days' time all the working forces were created and each and all were ready to begin the great task given to them. Apparently all cells were alike — each possessing a nucleolus, a nucleus and a body filled with the required building materials. Yet each was equipped to do a certain and definite work. Some were to make bone; others muscular bands; some nerve fibers; others connective tissues, and all the other various elementary tissues which make up the body of man.

All these countless workers engaged in the building of my body structure are called "somatic" cells, to distinguish them from the "generative" cells whose duty it is to give birth to a new being when the proper time and opportunity presents itself.

I told you how the main working force was organized into three groups — cells of the Ectoderm, Entoderm and Mesoderm.

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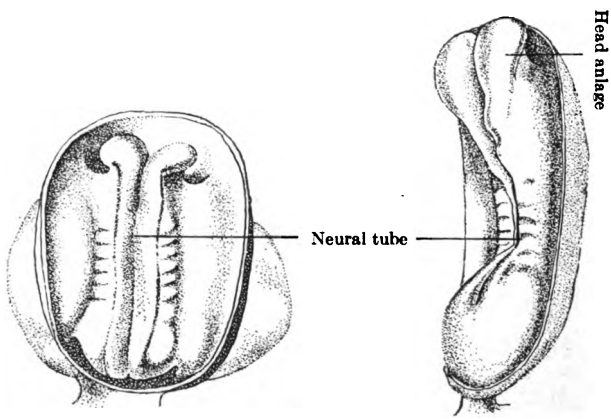

FIG. VIII. — DIAGRAM SHOWING ORIGIN OF NEURAL TUBE. (Kollmann.)

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The intermediate cell mass was asked to increase its force and immediately proceed to make a polygonal plate within the sanctuary of the blastula. In a short time their number grew so large that it was impossible for them to stand in one straight line. Some were asked to move forward or inward so that a groove in the plate was made. Other Mesodermic cells came and pushed the sides of this primitive groove together. They met and fused, just as if nature intended to put in a box pleat. The hollow of this human box pleat was the principal neural passage wherein later developed the main cable of the intricate nervous system — the spinal cord.

The appearance of this primitive neural tube was the earliest indication of a body. In fact that primitive column was the very foundation of the whole body structure, around which all the principal organs were later symmetrically arranged. I must not forget to mention here that the ends of this important tube, especially the upper end, remained open, and, enlarging, created the two main vesicles of my brain. Figure VIII.

The first problem given to the cells of the

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Mesoderm was so successfully solved that it inspired the cells of the Entoderm to assist. They came in great force and formed an isolated column about the primitive streak.

When it was inquired of them the purpose of that column, "Notochord," they said: "We cannot help form nerve tissues, but we can provide for the protection of that vital organ."

Subsequently they formed a cuticular sheath around the neural tube — to serve as its fortification. From the pulp of the Notochord ultimately developed the whole vertebral column as well as many other bones of the skeleton of my body.

With great care I saw to it that this delicate fortification of the neural tube met no accident during its early development.

Sometimes it happens that the lower one third of the primitive spinal column remains partially open, causing the protrusion of the spinal membranes or nerve fibers of the spinal cord. As the spinal cord is the main channel through which nerve impulses are taken back and forth from the brain, such an unfortunate abnormality seriously interferes in the con-

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tinuous and undisturbed nerve communication of the lower half of the body with that master organ, retarding the growth and development of the limbs and also causing the collection of fluid in the head cavity.

Such a congenital (existing at birth) cleft — "spinal bifida" — gives birth to a child with an abnormally large head, called therefore "hydrocephalus" (water in the head). The most unfortunate feature of hydrocephalus is that the water interferes with the development of the brain and the unfortunate infant has to go through life mentally deficient as well as physically defective. The legs grow little after birth.

Oh, how happy I was when I saw that I had escaped such a congenital malformation.

The primary task of the cells of the Entoderm and Mesoderm was done well. Therefore, they were sent to do other great things for me. For instance, the Mesoderm, lying between the other two groups of cells — Ectoderm and Entoderm — took up the great task of uniting the different structures by creating muscular bands between them. It also provided all these organs with the necessary blood

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channels through which they were supplied with the required sustaining and building elements. A certain number of these vessels carried away the left-overs to avoid any congestion.

While the cells of the Mesoderm were looking after the muscular movements and circulation and excretion, the cells of the Entoderm were busy building the organs of digestion — lining the main digestive tube which was situated just under the primitive nerve channel. It was marvelous to see how the different intricate digestive mechanisms by and by developed from this one structure, either by evagination or invagination — by outgrowths or ingrowths of the walls of this tube.

The cells of the Ectoderm did not share the task of laying the foundation of my body. They were looking after the protection of the whole. Later theirs was the great task of adorning my external body with the different appendages of the skin, such as the hair, nails and enamel of the teeth.

In this simple manner the foundation of my body was laid by the formation of the neural tube and the Notochord, which separated the

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former from the primitive digestive tube. Gradually through evagination and invagination countless little precious organs, like the opening of the petals of a rose, began to unfold themselves from the one great original unit — the fertilized ovum.

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CHAPTER V

HOW I WAS FED AND TAKEN CARE OF IN THE FIRST WEEK OF MY EXISTENCE

It is surprising how early I began to be affected by the same laws of nature that are applied to your world and its inhabitants. Hardly had I come to be when it was found necessary to provide for my nutriment and protection. "Then if life is to be sustained, its owner must be sufficiently nourished and adequately protected," argued my mother.

I was only a few days old when every working unit in me was begging for food,—"building material," — they called it, but I knew well that it meant oxygen and other elements as well. Therefore all the cells of the Ectoderm which could be spared were sent out to build up a temporary kitchen.

Obeying the call of my master builder, they came forward from the periphery, joining forces, formed and filled a good-sized bag with a jelly-like matter. This "yolk sack" was a

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perfect kitchen or provision house. It contained all the countless elements that were used by each different group of cells. In fact, it did supply that wonderful workshop with more than it could immediately use, so that soon an exit for the superfluous matter was found necessary.

So another bag had to be formed to take care of the waste products and left overs. The latter bag was called "Allantois." While the yolk sack was attached to the center of the main body cavity and primitive digestive tube, the allantois opened into the so-called hind gut, at the lower digestive tube.

The allantois was a most efficient little organ, in spite of the fact that it was made for temporary use. This structure was made up by the cells of the Entoderm and lined with the cells of the Mesoderm. The cells of the allantois immediately went about to fulfill their given duties in a most remarkable manner. They pumped into the main workshop enough oxygen to burn up or at least sterilize all waste products, so that no harmful elements were retained within the ovum. Therefore, it is fair that I should call the allantois a most

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perfect "distillator" as well as a remarkable "reservoir" of the primitive being.

The lives of these two structures, the yolk sack and the allantois, were short, but for the time being they served their purpose perfectly.

The next step in my development was the coming of the protective membranes. A reserve troop of cells, which were waiting at the periphery, were liberated to form two external folds which grew and met above my head, forming a complete bag about me and entirely separating me from the frail outer wall of the ovum — so that the great creative work within me could continue without being affected by the disturbance from without.

This third cavity — a bag — called the "Amniotic cavity" was also filled with a fluid matter. The specific gravity of this was such that I could float in it freely and retain my position, no matter what my mother was doing, whether she was standing, stooping, sitting or lying down.

If you could have peeped through the walls of this amniotic cavity, you would have seen me floating and swaying about from one end to the other of my watery cradle. This per-

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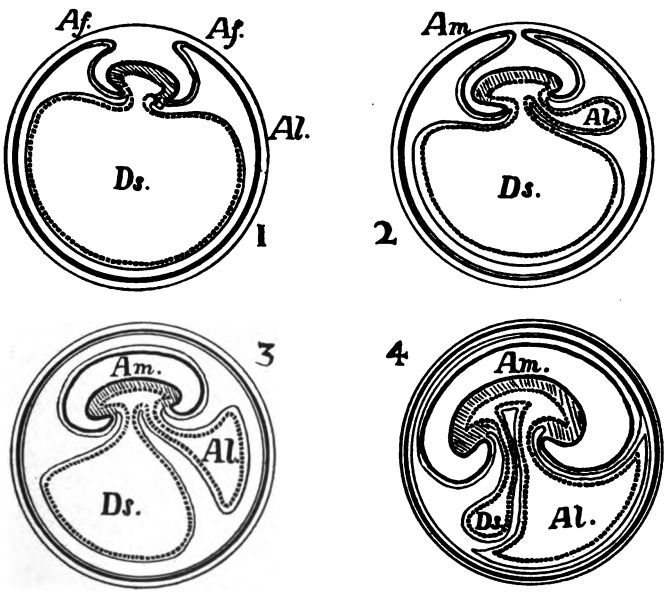

FIG. IX. — DIAGRAM SHOWING DEVELOPMENT OF DIFFERENT NUTRITIVE AND PROTECTIVE BAGS.

Am. Amnion. *Al.* Allantois. *Ds.* Yolk-sack. (Gegenbaur.)

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haps was for the purpose of cleansing my outer cells. Or perhaps through that act of swinging about, some of the external cells were to collect nutriment from the waves of the amniotic fluid.

Evidently Mother Nature did not consider this one protective shell sufficient, for soon the external coat of this bag separated from the inner lining so that I found myself within two separate bags. The larger and the outer one was the primitive "Chorion." Figure IX will show you the relative size and position of these different bags and cavities — the chorion, the amnion, the allantois and the yolk sack.

I was not more than a week old when all these structures came to supply me with the necessary building material, to take care of the waste and also to protect me from all external harm. I take great pleasure in assuring you that they all did their work well. I suffered no harm, and all my wants were met most punctually.

These various bags are already gone, yet with great gratitude I think of them. Would that every newly formed working community could pattern after this perfect model of

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efficiency present in the primitive human egg. While the countless working cells were created and to each was designated a definite duty, all was done that could be done for the welfare and safety of each cell. The result was a most harmoniously working unit. Not a cell went on strike, not a single working force refused to do its utmost in the accomplishment of that great task — the construction of my body.

I was surrounded by no experienced and expensive cooks, nor was I guarded by brave and unbribable policemen; yet I am assured that any financier or king of your world would bitterly envy me for the luxury, comfort and protection that was mine even while my existence was not suspected by anyone.

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CHAPTER VI

HOW I CAME TO MY PRESENT DWELLING PLACE

THE formation of the temporary organs of nutrition and protection — the yolk sack, allantois, the amniotic cavity and the chorion — took place while I was still in the narrow Fallopian tube, during the first week.

At first all was well with me and about me. But on the eighth day I noticed how the narrowness of my dwelling place was beginning to interfere seriously with my rapid growth. Besides, the shrunken looks of my bag of provisions began to worry me.

Then I knew too well that the demands for building materials were growing too numerous and too varied for my modest temporary organ of nutrition. The faithful little cells that made up the yolk sack had almost exhausted all their supplies. It seemed imperative that they should soon be excused from further pro-

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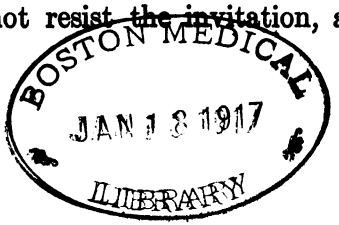
viding food for all the millions of working cells engaged in the making of my body.

However, before I was subjected to actual want, a great inner desire — call it "instinct" — took hold of me. I felt as if I must move on downward as suggested to me by the flow of the fluids about me. I obeyed nature's call and rolled on until I arrived in a much larger space. It was the cavity within the uterus, called, therefore, the "uterine cavity."

It seemed as if this new community had anticipated my coming. It was in readiness to receive me. As soon as my coming was suspected, great forces were utilized to prepare a cordial reception for me, as well as make me comfortable during my stay. A general housecleaning had been undertaken; the structure of the whole uterus had been looked over. Some of the muscular bands and elastic tissues forming the walls of the uterus were reinforced and great volumes of blood stood in readiness in the countless superficial vessels of the uterine cavity in order to assist where help was needed.

As there seemed to be no other tenant I could not resist the invitation, and made up



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my mind to settle down at a convenient location and remain there as long as I was wanted, hoping that it might be until I was ready to enter your world; when I may enjoy the home which my parents so lovingly are preparing for me there.

As soon as I had selected a desirable location at the right side of the uterine cavity, a little pocket between the folds of the uterine lining was prepared for me. I moved in with my whole household. My faithful outer covering, the chorion, immediately dug a little foundation into the maternal tissues, so that I could be permanently and firmly located. It was very important that I should at once imbed myself between the inviting folds of that mucous membrane. The uterine fluids seemed to be inclined to wash me out. I did not wish to be discarded or aborted, for I knew well that I was, as yet, in no way prepared to live in your world.

Soon human curiosity drove me to investigate my surroundings. I found that the normal uterus is a hollow organ, pear-shaped in its general form and not much larger than an average pear. The walls are made of remark-

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ably elastic tissues which seem to respond to my movements almost mechanically, expanding and shrinking as required.

I wonder if there is such a remarkable dwelling place in your world, which without much effort, but at the slightest suggestion of the tenant, meets all his needs. When additional space is required the house grows just large enough so that it is never too small or too large; always cozy and snug for the inhabitant. When it is empty, as after the departure of the little being, it shrinks and gradually regains its former shape and size.

The inner lining — mucous membrane — falls loosely in folds which open and stretch as the uterine cavity grows larger. This lining is supplied with little openings or pores out of which comes a fatty secretion to keep the interior soft, moist and clean. When I first arrived, this velvety sheet immediately embraced me and threw its folds around me. The sides met and were united, forming an additional protective envelope about me. This one is called "Decidua."

Thus you notice that I was not only welcomed and comfortably housed within the

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maternal uterus, but also all was done that could be done for my welfare and protection.

When I am born you will have an opportunity to see all these different nutritive and protective coverings, — the amnion, the chorion, as well as the one supplied by the uterus. As all these protective tissues are expelled soon after the birth of the child, they are called by you "Afterbirth."

When I was well settled it was time to think of ways and means to get nourishment and building material. The faithful chorion, my outer covering, began to dig from all sides into the deeper tissues of the uterus until the blood vessels were reached. There took place no fight between me and my mother's tissues, as often stated by scientists; but again my new dwelling place responded willingly to all my needs. Soon with the aid of the maternal decidua hundreds of little channels were formed, bringing in to me, in the form of blood, all elements necessary for my being and for my great work.

Subsequently, about the third month, the protective membranes, the chorion and the decidua, united and were called "Placenta,"

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and through all the trying months they faithfully looked after the nutriment of their "protégé," — me — providing it with the necessary food and oxygen.

I don't want you to understand that I used the blood of my mother just as it came, perhaps laden with all sorts of germs. Perfect sanitation laws, that were in effect all about me and in me, could not allow such an oversight. Every drop of blood that came to me from my mother was first modified and clarified in the temporary reservoir within the chorion — placenta.

The uterine arteries poured the required blood into the receiving vessels of the chorion, where they were retained until the necessary changes had been effected. Finally this modified blood was sent to me through one large long artery.

However, the supply was most generous and all could not be used. After all the required elements had been extracted, the waste and what was left over was sent back through two vessels — veins — to the placenta and thence to the veins of my mother. Thus from the placenta — which served as my reservoir

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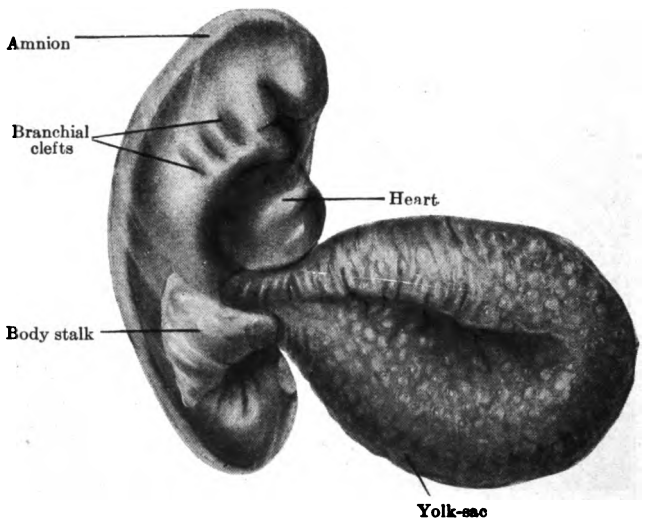

FIG. X. — EMBRYO OF 2.6 MM., SHOWING YOLK-SACK AND UMBILICAL CORD. (His.)

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as well as my distillery — came to me one artery and two veins, which together formed one cord. This "Umbilical Cord" shall carry blood back and forth between me and my mother as long as I remain the tenant of the uterus. Figure X.

What a wonderful provision of Nature. As it is, we little yet-unborn ones are spared many a disease which affect our mothers during our stay with them and in them. If the mother's blood flowed directly into our delicate systems, few of us would ever be able to be born healthy and sound.

On the other hand, how much more would the systems of our mothers be overloaded with waste, which necessarily arises in our great workshop, where such a complicated mechanism as our body is constructed, if the veins of the umbilical cord emptied directly into the veins of our mothers.

Yet in spite of this precaution nature has taken, our mothers feel only too often, especially during the first three months, the disagreeable effect of the additional waste thrown in their bodies. Their organs of elimination — kidneys and intestines — are often over-

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taxed during the period of our coming. At times they are even unable to take care of all the combined waste products. Especially in the early hours of the morning my mother seems to feel so overloaded with unused elements that she is forced to discard artificially, through the mouth, some of such undigested matter. This annoying symptom — "Morning Sickness" or "Nausea" — was the first sign of my coming which was noticed by her.

I regret most sincerely that my coming was thus unpleasantly heralded. At no time had I more reason to be grateful and pleasant than in the first few weeks, when all was done that could be done for my settlement, comfort and future being.

It was most fortunate that I made a change of my dwelling place at that critical time. Had I stayed very much longer in the narrow Fallopian tube, I would have been forced to starve or suffocate, as the thin walls of the passage would have been unable to withstand severe stretching, caused by my rapidly growing body. Surely sooner or later it would have ruptured, expelling me into the abdominal cavity, where no provisions are made

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for my housing and development. I would have perished.

Sometimes such sad accidents happen. One speaks then of "Tubal Pregnancy," which necessarily terminates in the premature death and abortion of the little one.

How lucky that I did not make such a fatal mistake, but instead responded to the pressure from above and came down into the uterus, where I was so cordially received, and so lovingly housed and so generously provided for.

If every normal childless woman or man could picture to themselves how much serious effort nature makes for the welfare and well being of the little one, and how it resents, after all that preparation, being forcefully removed, they would surely hesitate before they interfere with the progress of the great and Godly miracle. All we little ones ask is to be given a chance.

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CHAPTER VII

HOW THE FRAMEWORK OF MY BODY WENT UP

WHEN the first fortnight of my existence was over, I looked back to see whether anything was left undone which ought to have been done. Thanks to the great Thought, which was supervising most faithfully the construction of my body, all was well with me and about me.

By the third week I was settled in my comfortable and well equipped home in the uterus. All my needs were met most punctually — the working forces within were carefully organized. Each cell was attending to its own task as if the welfare of the whole depended on the efforts of that one cell. Perhaps they knew in their own way that one single disorganized or misplaced cell, at a critical moment, might seriously interfere with the workings of the whole mechanism.

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At that time I was perhaps the littlest little human being man has ever seen — not larger than the pupil of my mother's eye. Possibly I could not have been found among the tissues about me without the aid of a microscope. Scientists, who have seen such little human beings, say that they are indeed not much to look at — even painfully devoid of the pleasing features that differentiate a human being from any of the lower animals.

Therefore, it has been justly said that we little no-ones, during the early months of our physical development and coming, recapitulate — repeat — the evolution of the race. According to this *law of biogenesis* the newly fertilized ovum may be compared to the lowest form of unicellular organism — like the amœba.

After segmentation, when the working forces are created and organized and the primitive body cavity is formed, the ovum is said to resemble an organism like the adult volvox. With the coming of the digestive tube the little human being looks like a simple sponge. Later when some indications of the framework appear, such as the soft notochord, one justly speaks of the little one passing through the

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stage of a worm. When a structure similar to the gills of a fish appear, it is compared to a fish, and so on until it reaches the stage of Man.

I am not ashamed to confess that I, at that stage, possessed a body containing two long tubal structures — primitive neural tube and the digestive tube — just like the worm. Fortunately my body — with a head and tail end — had taken such a curved attitude that the latter, painfully suggestive of my remote ancestors, was carefully hidden away from sight. It is perhaps for this reason that all undeveloped beings like me modestly retain such a position until they have received all the pleasing features of man. Figure XI.

Lack of good looks did not worry me much at that time. I was happy that every new moment was taking me one step forward in my evolution. The notochord, the temporary protective shell of my most delicate nerve mechanism and the forerunner of the framework of my body, soon began to be replaced by cells which had the ability to increase rapidly and form a dense fortification around the primitive spinal cord.

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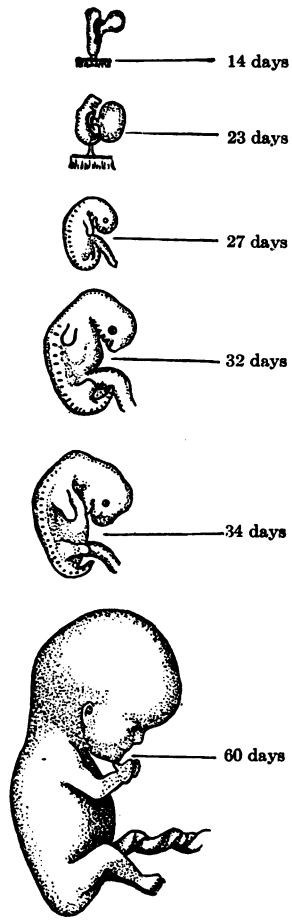

FIG. XI. — EMBRYO IN SIX DIFFERENT STAGES.

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At first this temporary framework was much softer than any bone — a condition which annoyed me at the time being. I knew that if I wanted to be a human being I had to possess a hard bony structure to give me the required pose and the erect posture.

Therefore, day after day, with great anxiety and curiosity I watched the development of this new structure. About the 25th day little horizontal lines appeared dividing the whole into a number of segments or somites. Figure XII.

In the meantime the same soft framework, composed of membrane-bone or cartilage-bone, was gradually being partly hardened and partly replaced by real bone. I also noticed that the 37 original divisions or somites of the primitive dense structure were developing into the segmented vertebral column.

Thus three different sets of cells were used in those few weeks to form a protective column around the main trunk. It seemed at first extravagant waste of time and precious cells. But my mother thinks that this incident is another proof of the Darwinian theory. The first beings did not need protection for their

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main nerve trunk. But by and by the enemies of each increased so that it had to fight for its existence. Therefore, it became necessary to reinforce this protective structure. Finally in the vertebrates it had to be made of hard bone.

As the cells of the original notochord did not possess the ability to ossify, new cells of different contents were required. These undoubtedly developed in the battle of life of countless generations. Hence I am being equipped with a really bony spinal column.

Before the ossification of this structure had begun, other parts of my body framework came branching out of this main fortification. Nine little twigs came, grew and surrounded the chest or thoracic cavity, in which later the delicate organs of respiration, digestion and the heart were housed. Each of these nine ribs was in time supplied with a pair of nerves, a pair of muscle segments and a pair of vessels to assist in its great protective work.

The skull, the protective cup of the brain, developed about the same time, also partly budding out from the primitive notochord. In the same way originated the bony foundation of my extremities — arms and legs. The

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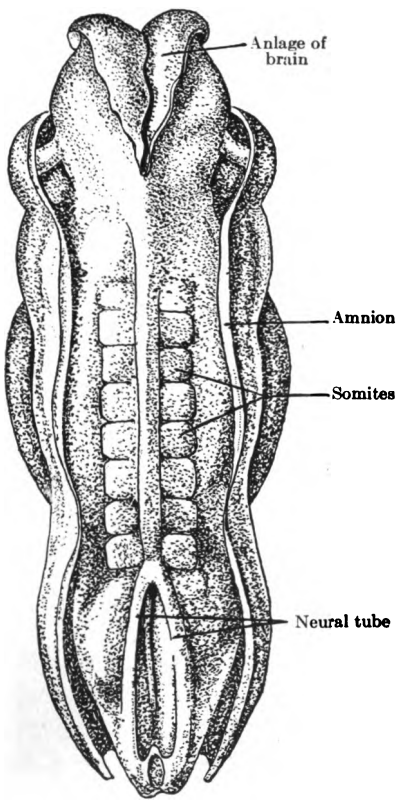

FIG. XII. — EMBRYO WITH PRIMITIVE SEGMENTS. (Eterhod.)

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framework of the arms grew more rapidly than that of the legs, which proved to me the happy fact that I had possibilities of climbing very much higher up the scale of animal life.

With the coming of the vertebræ I was not only made eligible to the highest organization in the great animal kingdom — the vertebrates — but I was assured of being able to withstand a great many hard knocks, which I am apt to receive when a member of your troublesome world.

Think of all the great things I will be able to accomplish with plenty of nerve to start the given problem and enough backbone to stick through — especially if I can supply a little bit of *plain common sense* to guide me all through the undertaking.

However, the process of ossification of my skeleton will not be completed until some time after my birth to your world.

You might think I ought to hurry up with my work and not bring such unfinished structures. But a moment's consideration will reveal to you the reason why the complete hardening of my skull and also of the framework of my body is postponed until after birth.

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I am advised to be soft and pliable when I am born, because the passages through which I shall come are narrow and curved. Thanks to this great forethought — to the softness of my bones — it is possible that I may be born without seriously injuring the framework of my body in spite of the limitations of the maternal passages. The separate links of my spinal column as well as the segmentation of the whole framework will greatly facilitate my coming.

Another provision toward my safety during that trying occasion is made by the division of the hard protective cup of my head — the skull — into a number of separate plates, so that they can give way if necessary without breaking. My skull, therefore, will come in six different pieces.

There will be little free spaces in between the bony plates covered only by membraneous tissues. Most of these openings will close soon after birth, but the one on the very top of my head will persist for at least a year. Such open spaces between the different parts of the skull are called "Fontanelles." Unless my mother is careful, the brain — the most

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precious organ in my body — may be injured through these congenital openings.

When the bony framework of my body was coming into being I almost believed that after all I was only a tiny little tree. First appeared one single column, and from this main trunk then came sprouting nine twigs — the ribs — and four larger branches — the framework of my extremities. Later all the soft and delicate organs symmetrically arranged themselves around or within this bony skeleton, just like the leaves of a tree.

It was not many years ago when a tiny human being, with the very first signs of a skeleton, was seen and studied by a scientist. As it already possessed all the main human characteristics, he called it "a human embryo." Since then every little being during the first three months of its uterine life is known by that name. Evidently that great scientist was very proud of his discovery and wished to immortalize his efforts, because immediately he called himself an "Embryologist," — scientist engaged in the study of embryos.

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CHAPTER VIII

THE COMING OF MY VARIOUS INTERNAL AND EXTERNAL ORGANS

At first I was not quite pleased with the name given to me. "Embryo" sounded too ancient and foreign to me. But when I found out that it meant "to be full of —" with a dash, to be substituted with any word one may choose, I was quite reconciled. I made up my mind, or to be more truthful about it, I would have made up my mind if I had had one, that the dash should spell "life." It was true that, in spite of my minuteness, I was as full of life as any living creature of your world.

Life manifested itself everywhere in me, making every cell almost buzz with real business. Only a very small colony of cells, standing about the neural tube, seemed to have no urgent duties on hand. Perhaps because of their apparent inactivity they looked distin-

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guished and aristocratic. They were larger and seemed better nourished than the somatic cells, and through their clearness they were most conspicuous.

When I inquired about them I was told that they were the "primary germ cells" which are to be the life-carriers of my own body. At that time I was still sexually in an "indifferent stage" — I did not know whether I was to be a boy or a girl. Therefore, eagerly I looked them all over, but unfortunately received no enlightenment on the subject. The distinguishing sex features had not yet appeared. Hence I was unable to tell whether they were to develop into ova or spermatozoa.

Still it was interesting to see them, for they reminded me of a time twenty-two years ago, when I was like them — only a primitive germ cell in the body of my embryo mother. What a remarkable cycle! It was now my turn to form a link in the great human chain and to provide for future links as well.

This thought was gratifying and encouraging. I needed something to cheer me up. There was in reality so little of me, and that very ungainly. In spite of my remarkable skeleton,

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externally I was just a fishlike being with an ugly and unproportioned head and a suggestive and offensive looking tail.

However, one beautiful morning when I was wondering where I could begin to alter, the master builder sent orders to divide up the main body-cavity into different chambers, of different size and form. I had to be very careful in my measurements, for each had to be just large enough to hold the particular organ, without handicapping it in its development and in its workings by being too large or too small.

The main trunk was then divided into three chambers. The upper one, nearest the head, was for the principal organs of respiration — for the lungs and for their intimate comrade — the heart.

The second chamber, which was very much larger than the others, came to be my abdominal cavity, the home of most of the organs of digestion — stomach and intestines — and also of the organs or glands which are to assist in the great process of digestion. Such digestive glands are the liver, gall bladder, pancreas and spleen.

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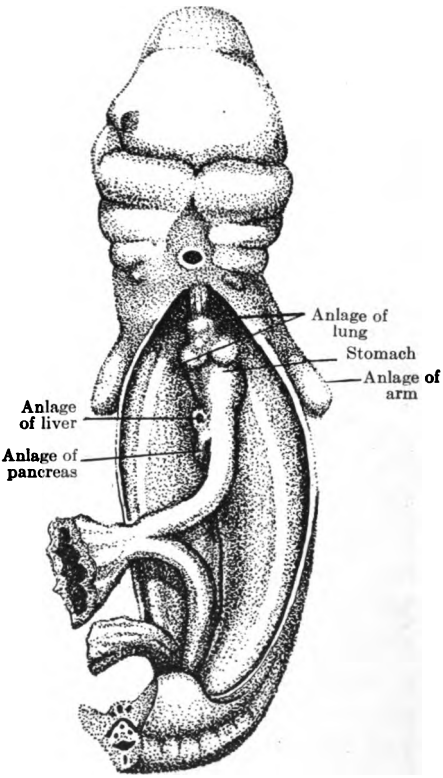

FIG. XIII. — EMBRYO SHOWING FIRST BUDS OF ORGANS. (Prentiss.)

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The third and smallest chamber was to hold the organs of elimination and reproduction.

Hardly was the work on the partitions completed when the little dwellers began to come. About the third week one could see a number of tiny buds sprout from the walls of the primitive gut. From the German comes the scientific name for these buds; "Anlage" they are called. It is a good word. Literally it means "to lay at" — hence the anlage of thyroid shows where this gland is to lay.

Figure XIII will show you the anlage of my lungs, which looks like a bunch of grapes at the end of a tube. The latter was originally also a part of the primitive digestive tube. Gradually it became a separate structure, running parallel with the other. Both had their outer openings in the mouth.

The air passage is not to be very long. The portion entering the mouth is called larynx. It is to contain that wonderful sound-producing mechanism — the vocal cords — which consist of two muscular bands strung on each side of this tube. When the air passes upward back into the mouth it stretches these cords, and the sudden pressure produces certain sounds

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known as the "human voice." The quality and quantity of the produced sound will depend greatly on the thickness and the length of these cords and also on the resounding passages and cavities, such as the mouth and the nose.

I am told most remarkable tales of the power of the human voice. They say it rules and governs the whole world. Man and beast obey its call. Yet it is the sole igniter of happiness and sorrow — it is the cupid's arrow as well as the sword of wrath. Would that I could possess such a voice!

The main portion of the windpipe is called "trachea." The lower end of the trachea divided itself into two main branches, — branchial tubes. The air passes through the mouth or the nose, the larynx, the trachea and the branchial tubes and then into the lungs. Any harmful elements in the intaken air may therefore lodge in any one of these regions. Mother Nature will especially protect these delicate passages from harm and is therefore supplying them with a protective lining — mucous membrane — which through its secretions can destroy or wash out many a foreign matter.

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But when the mucous membrane is not successful in performing this protective act alone, the deeper tissues will take up the fight. By sudden contractions and expansions they will forcefully shake up the whole passage for the purpose of discarding such undesirable foreign bodies. This act is called "coughing" — "sneezing." Sneezing takes place when the foreign body is in the nose; coughing, when it has entered the windpipe. It is a pity that both of these self-protective acts of the body have been ostracized by "elegant" and "good" manners.

The lungs are to be of great importance for the welfare of the body. They are to purify the blood by the respiratory process and also extract from the intaken air the available oxygen and prepare it for its distribution. As the duty of the lung is of supreme importance, my Maker wisely placed it in a very safe chamber — in the chest — which is fortified by the ribs and the vertebræ.

The body of the lung is wrapped carefully in a sack — and is divided into different lobes. The right lung consists of three lobes and the left of two, so that each

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part is somewhat isolated from the other (a protective measure in time of disease). When one lobe stops working the other may continue pumping without intervention.

Besides the principal organs of respiration, another vital system — the vascular blood system — will have its headquarters in this first chest chamber. The heart is its main distributing organ. It is interesting to me to know that these two vital organs are put together in one chamber to be neighbors for life.

The heart did not bud out from the walls of the primitive tube like the lungs, but it came to be by the union of two separate bags, which at one time were located at each side of the neural folds. When this human box pleat was formed, the two separate heart vesicles also met and within a short time united into one great organ, which is to pump liquid life — blood — into every living cell of my body. With each beat it will announce the presence of life within. It will only then stop pumping when all the other organs have already given up their life work for which they were created, and no more require its services.

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When I think of the great work this little bag is to do for me, I feel ashamed of myself. For a time I disliked it intensely. It was so large and bulky and seemed so much in the way. For the first few weeks the heart was right under my chin, bulging almost out of my body. However, as soon as its private chamber was ready, it withdrew and permanently located itself where it ought to be.

Before the final fixation of the heart, the blood vessels of the yolk sack joined the two primitive blood vessels of the heart, and with the gradual shrinking of the yolk sack they also were taken inside my body, and established the vascular system within me.

The vascular system consists of a series of tubular vessels, which distributes blood to all parts of the body and gathers all fluid waste and carries it away so that it may be discarded.

The lymph vascular system collects in its little pockets — lymph glands — all the waste within its reach, and through its channels finally takes them to the different elimination stations. (Any "city garbage collecting department" can learn a great deal from this tiny but perfect eliminating system.)

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I often think of my body as one big perfect house with its various systems to make life within possible and agreeable. In that case the so-called vascular system may be well compared with the plumbing of a house.

By and by, this whole system was divided up, and each was given its particular location and duty. The arteries which are to carry the purified blood received thicker tubings and were carefully placed within the deeper tissues, where they are comparatively safe from dangers from the outer world.

The veins through which is to run the impure blood were placed more superficially. The walls of these vessels are much thinner. Little vessels — capillaries — were sent everywhere to the surface to bring nourishment to every distant cell and to gather all the waste they could find. Also they are to be on patrol duty day and night to gather all harmful intruders. These little protectors will be assisted by the lymph vascular system and also by the urinary system — the kidneys and bladder.

The kidneys were very restless little beings at first. The anlage of the kidneys sprang

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from the so-called hind gut, way down in my body. But they seemed to have from the beginning the good intentions of moving upward until finally their progress was stopped by the liver. So that they are now located just under the liver, each in a separate fatty bag. As the right liver hangs lower, the right kidney is placed lower than the left one.

Sometimes one or both kidneys refuse to settle down at the given nook and keep on wandering even after birth. They are known as wandering kidneys and become very annoying to their master. The duty of the kidneys is to extract the fluid waste from the blood and send it to the bladder, from where it may be discarded. They are part of the plumbing system of my body.

The organs of reproduction are to hold and assist in the coming of a new life. Their anlage appeared in the tissues of the neural tube, but they have already started toward their final dwelling place in the lower abdominal cavity.

When the partitions between the first and second chambers were completed, the cells of the entoderm went about, making little

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beds for each of the soft and delicate digestive glands such as the liver, pancreas and spleen.

It was most interesting to see them come in pairs. Each gland developed from two hollow buds or outgrowths of the primitive tube. When the main body plate folded itself, each pair met and fused. Uniting, these remarkable glands began to sprout and bloom into separate clusters — just like the bloom of a cauliflower. Each of these compound spongy structures are to provide the body with the necessary digestive fluids.

The stomach came to be through the gradual enlargement of the primitive gut at the proper region. The digestive system will have charge of the culinary department of my human household.

The duty of the muscular system is to make possible the movements of the various parts and organs of the body and control their motions. It is very interesting to see how these elastic bands that came in bundles can contract and expand as commanded by the brain. Each muscle is already supplied with one or more nerves through which comes the command for action.

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'Tis true that the duties of each system, on which the welfare of all the others depends, are manifold. Any disturbance in one soon interferes with the workings of all the others. Yet the nervous system may justly be considered the master of all. It consists of the brain, the spinal cord and the efferent and the afferent nerve fibers which form a dense network of nerve channels all through the body.

This intricate system holds and liberates all forces or energies used in the performance of the various duties of life. Each organ in the body derives its power of action from the brain through the various nerve channels. The digestive system, respiratory and vascular system, merely contribute elements for the production of life-force.

The great secret of good living is to produce just enough force to perform the work at hand. Any excess in production is apt to overcharge the delicate nerve mechanism, invariably causing a premature breakdown of the whole system. I am told that the problems that face man in your world at the present time are such, that often they necessitate the production and liberation of too much energy.

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I am happy to learn that under normal conditions our mechanism will be capable of using up automatically some of the excess energy. When anger, fright or pleasure overcharge the nervous system with unnecessary forces, the body performs certain unexplainable and involuntary physical acts — just to burn up the unused energies and to reëstablish the equilibrium of the body. Hence the act of screaming, crying, laughing, clapping of the hands or stamping with the feet. They all are performed to relieve the delicate nervous system.

It is very unfortunate that social ethics and laws of good manners have restricted the use of such involuntary protective physical acts, because when they are suppressed, the nervous system is in danger of being overcharged and may suffer serious consequences. Who can deny the harmful effects of suppressed sorrow or grief or the relief one feels after a good hearty cry or laugh.

"Good form and etiquette breed nervous wrecks. Nervous breakdown is a disease of civilization," says the philosopher.

Volumes could be filled with the various duties of each particular organ of each cell

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in my great workshop. I only dare mention a few in an effort to impress on you the magnitude of the task of living, and the importance and sacredness of the nine months of my embryonic life when this remarkable mechanism is constructed and equipped to live the life of its time.

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CHAPTER IX

THE DEVELOPMENT OF THE EXTERNAL ORGANS AND MODELING OF MY FACE

It is a very strange coincidence that the face — to be so beautiful after birth — was almost offensive looking in the first few weeks of my embryonic life. One may almost think that even we embryos are painfully conscious of the homeliness of our heads, as we bend downward, almost burying our faces within the neighboring parts, until better looking features have been formed.

Look at Figure XIV. I am sure you don't blame that embryo for wanting to hide its face. It has lifted its head just to show you how its primitive face looked before the modeling of the features. One can hardly comprehend how a beautiful human countenance could develop out of apparently nothing. The face seems to consist of a large opening surrounded by a number of liplike projections.

At the beginning of the second month, when

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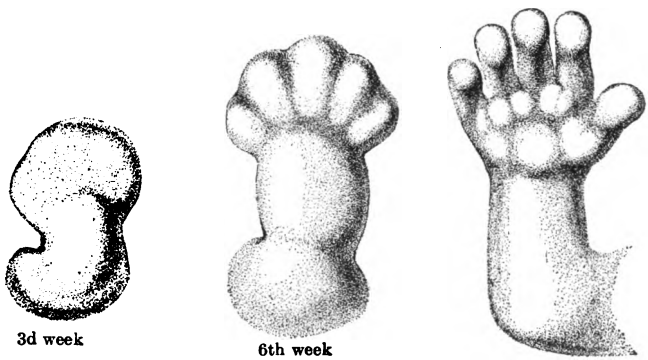

FIG. XIV. — DEVELOPMENT OF HAND.

FIG. XV. — EMBRYO SHOWING MODELLING OF FACE. (His.)

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looking into that large opening, one could see three little clefts, making four archlike elevations. These unassuming clefts and projections gradually gave birth to a number of useful organs; and a great deal of the material used in the making of my tongue, teeth and the various organs situated in the neck, was furnished by these gill-like structures.

The first step nature took to alter the ungainly mouth was to unite its different lip-like projections in such a way that out of that one big cavity a number of smaller cavities were formed. As you see in Figure XIV, projections 5 and 3 as well as 6 and 4 have fused, making two little chambers for the eyes. Later 1 with 3, 2 with 4 partially united, leaving only two small openings for the nostrils. Thus the nose and cheeks were formed. The external form of the nose was complete by the eighth week.

Also the oral cavities were one with the primitive mouth. About the sixth week six little buds appeared around the first branchial cleft. They too, by fusion and rotation, came to form one structure — the external ear. Figure XVI will show this process. When

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the two outer edges of this cleft were united there came to be a long tubelike passage, connecting the outer opening with the interior chamber, where the very delicate hearing apparatus was at the same time being installed.

Then partitions were raised up from the surrounding inner embryonic tissues, so that the one original passage was divided into three parts. The middle portion, the interior oral chamber or tympanic cavity, was separated from the external passage by a delicate membrane — the future drum. The third portion was a narrow passage — Eustachian tube — leading into the larynx. This was perhaps to give the sound waves an additional passage to reach the organs of hearing. In the main tympanic cavity, cells were busy constructing the three bones which play a most important part in the act of hearing.

In order to prevent any interference from without, while this delicate mechanism is being put up, Mother Nature temporarily has closed off this chamber. But when I am ready to be born, that additional membrane will break, so that sound waves from your world can reach my drum unhindered.

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Looking over Figure XIV, you might be disappointed to find the external ears so much out of place, almost under my chin, but with the development of the neighboring features and with the upward tilting of the whole head, they will come to their conventional location. I must see that my external ears are well placed and proportioned before I am born, so that they are not embarrassingly suggestive of my certain ancestors, who are known by their ears.

A great deal could be said about the coming of the sense of hearing, but you seem to be more interested in the development of the eyes. 'Tis true they play a remarkable rôle in the life of man.

The eyes, besides transmitting pictures of the outer world to the thought centers in the brain, give at all times truthful expressions to the thoughts which are formed behind them. All the other senses may be taught to lie. The eyes ever look the truth, whether they be directed to a friend or to a foe. They are justly looked upon as the windows of the soul.

My creator must be very partial to this sense too, for the anlage of the eye was the

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first one to appear. Soon after the embryonic area was formed, two good sized round elevations were to be seen on each side of the head. When the neural groove closed, it left two openings at the proper region, out of which came, like a mushroom, the anlage of each eye.

As the outer covering of the eye-buds increased in size and thickness, there took place an inward folding, invagination, so that the bulging tumor was converted into a cup with an irregular bottom and double sides. Figure XVII.

Soon the border of the optic cup grew until the sides met and created a round chamber in which the delicate mechanism of sight was gradually installed. The visible portion of the eye consists of the white and opaque fibrous membrane — the sclerotic — which surrounds a transparent horny round plate — cornea — through which will pass to the iris the picture of the object seen. The inner surface of the iris is covered with some color or pigment matter, those which I inherited from either of my parents. At first the iris was colorless, but since then the inherited color granules have come and have painted it. As

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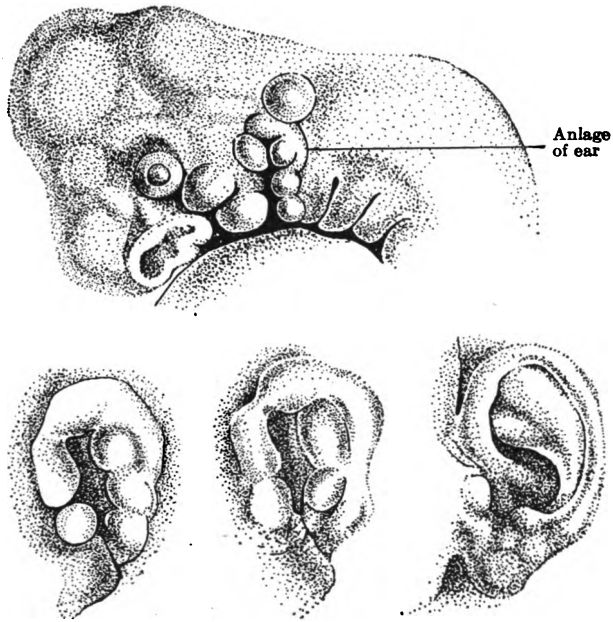

FIG. XVI. — DIAGRAM SHOWING FORMATION OF EXTERNAL EAR. (Cunningham.)

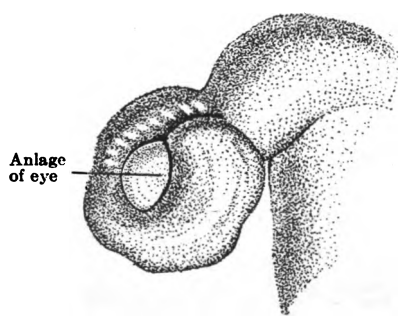

FIG. XVII. — DIAGRAM SHOWING ANLAGE OF EYE.

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my eyes remain closed until the time of my birth, I am not able to state whether they are brown or blue.

Within the inclosed globe two new folds came and met, and uniting created that precious organ of sight which you call "lens." This is a translucent round body, placed in the center of the pupil to collect the rays of an object and focus them on a given spot on the back wall — the retina.

While all this was happening inwardly, two folds appeared externally around the eyes. They grew and met, but did not unite, only remained closed. I was told that they were the eyelids. Their duty shall be to prevent the entrance of any foreign matter from without into the eye. They have already begun to fulfill their calling. In order to prevent the entrance of fluids about me into the eyes under construction, the lids are closed. But they have promised to open as soon as I come in contact with the outer world. Unlike other vertebrates, a child comes to your world with its eyes open.

While my external face was being modeled and the different parts were receiving their

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conventional form and location, the interior of my head was busy putting up partitions, dividing the whole into chambers of various sizes.

The main division took place through the formation of the roof of the mouth — palate. The palate formed by the growth and fusion of the first two branchial arches which grew in a horizontal direction and met, dividing the head into two main vesicles, the upper large one — the brain vesicle, and the lower one — the mouth. Figure XVIII.

Also the nasal chamber was separated from the mouth and from the oral chamber through the formation of the palate, which was at first soft, but has already begun to harden.

I was happy to see this process of union proceed uninterrupted. Sometimes this act of union is not accomplished. It is difficult to say whether it is caused by lack of sufficient building material or whether any difficulty in the mother's mechanism causes it. The roof remains divided. One speaks of "cleft palate," which is often accompanied by a division of the upper lip. This happens when the original projections 5 and 6 — Figure XIV

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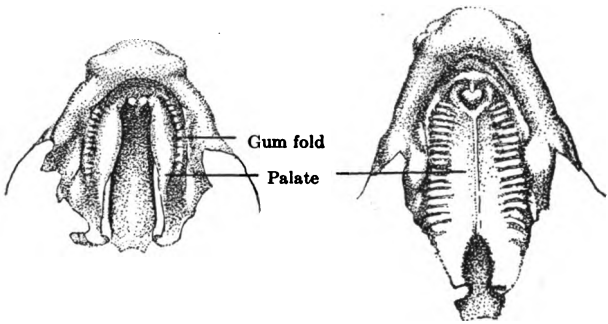

FIG. XVIII. — DIAGRAM SHOWING FORMATION OF PALATE. (Prentiss.)

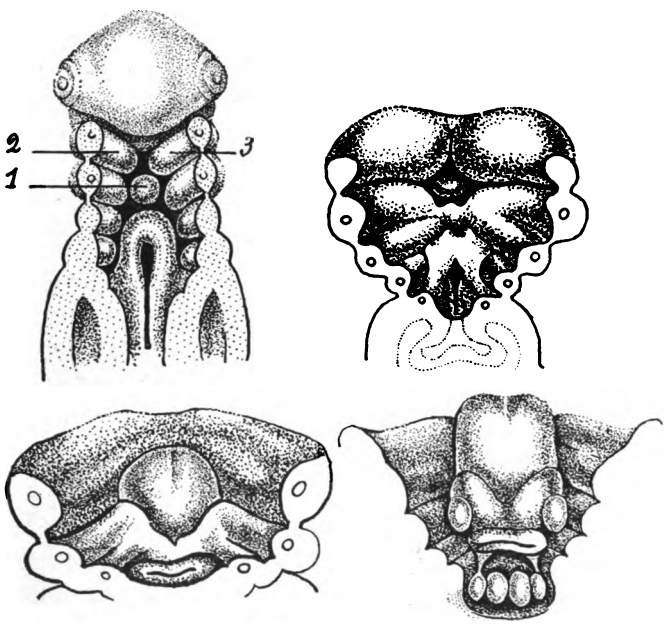

FIG. XIX. — DIAGRAM SHOWING DEVELOPMENT OF TONGUE. (Prentiss.)

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— do not unite. The unfortunate child is then born with a cleft palate as well as with a hair lip.

This is a very unfortunate accident of Nature, because these malformations not only seriously interfere with the formation of words, but also make it extremely difficult for the individual to take and swallow nourishment. The sense organs are then exposed to all sorts of dangers, as their chambers remain open. I need not mention its effect on the looks of the face.

I am speaking of these unfortunate possibilities so that every mother may appreciate more a physically perfect child. Also I want them to know just how in reality these so-called "birthmarks" may happen, so that prospective mothers may free their minds from all superstitious stories that often come and mar their happiness during the period of approaching motherhood.

Superstitious mothers must be told that the infant from the very first day of its being is an *independent* being. The mother only provides its temporary dwelling place and supplies the necessary nourishment. *Heredity and in-*

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fluences of unknown origin are solely responsible for accidental birthmarks and malformations.

Before the cleft in the palate was closed, two interesting folds appeared both on the ceiling and floor of the mouth and grew in a semicircular form, creating the gums. They are already equipped with the anlage of the first and second sets of teeth which are to appear at different intervals after I am born. For the present each tooth anlage hidden within the gums is made up of soft tissues, but soon bony cells will come and replace them.

As I told you before, the mouth is the beginning of the digestive tube, but for the present a membrane has closed up also this passage so that none of the fluids in which I am swimming can enter the lower alimentary canal. Sometimes they do get into my mouth, but they are expelled by such jerky motions of my protective mechanism which you call "hiccoughs." Some of my movements which seem to disturb my mother at times are the result of this act and not always are caused by the forceful movements of my legs which you call "kicking."

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The coming and development of my tongue is perhaps the most interesting among them. The anlage of the tongue is to be found at three different places. On Figure XIX they are marked 1, 2 and 3. At first the buds 2 and 3 grew and met. Then 1 stretched itself and joined them and brought them forward into the mouth. In this way this organ retained its firm base, but the main body was free to move about. In some people, I understand, it moves too much. In others where it should, it does not keep in action long enough.

Sometimes I am told it happens that the anlage 2 and 3 do not unite, but each develops independently. The unfortunate being is then born with a divided tongue, just like the tongue of a rabbit. This characteristic is better suited to the life of a rabbit, who leads a silent life; but a human being, who has to express himself audibly, will be greatly handicapped by such an accident.

Proudly I raised my head and looked about me. When I looked down I saw that the budlike anlage of my extremities had developed into a pair of properly articulated arms and legs. At first they looked just like stumps,

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with no signs of hands and feet — but by the end of the second month the hands and feet were well formed, even there were to be seen indications of fingers. Figure XIV. The fingers and toes remained webbed for some time.

Such was the beginning of the four faithful servants of my body. The arms will ever do all manual work for me, while the legs shall carry me wherever I may wish to go. The second month was literally my budding season. It was the springtime of my embryonic life.

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CHAPTER X

THE DUTIES OF THE BRAIN

With great joy and satisfaction I began the third month of my embryonic life. Up to that time all was well with me. The evolutionary period of my life was successfully passed. All resemblance to primitive forms of animals, such as that of the earth-worm and the fish, was completely lost by the disappearance of the gill-like branchial clefts as well as the tail. I was then already the happy owner of all the characteristic features of Man.

My head, though still very large and ungainly, was the center of great activity at that time. Therein was being housed a matter composed of millions of cells, each in itself representing a complete unit to be equipped at birth with the forces of life. These cells, besides being the energy-producing batteries of each and every organ in the body, are to hold, regulate and harmonize the functionating power of the whole mechanism.

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In time of danger, such as may occur by the entrance of any unfriendly foreign body, this wonder organ — the brain — will perform the duty of an indefatigable protector. No army of your world could be as efficient in taking up the battle with the invader and fighting it to a finish as my nervous system, commanded by the brain.

Furthermore, every act, physical or mental, is to be patterned there and executed only at the command of this organ. Every word spoken, every impression received, will be registered there. The negative of all experiences will be stored in that mass, to be used at opportune moments. Again, this great unit is to be the hidden chamber of my future personality. In short, "I" in my completeness am to dwell in that wonderful organ — the brain.

I simply gasped with wonder when I heard of the great things to be done by this unassuming gray matter which gathered in my head vesicle soon after the formation of the head anlage.

At the end of the second month, the three different parts of the brain could be distinctly

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recognized from without. Now the Cortex in two lobes occupies the top portion of my head. Behind my ears the Cerebellum is located, and the Medulla, or the base of this wonderful gray matter, connects the brain with the spinal cord.

The spinal cord, unlike the brain tissues, is composed of fibrous bands woven together into one main cable. These bands of wiry nerve trunks come from all parts of the body. An equal number go out from this main trunk in every direction so that every cell in my body has a double channel of communication with the master organ — the brain.

The efferent nerve fibers take commands from the brain to the designated organ. The afferent nerve fibers take messages from the distant parts of the body to the brain. Thus each organ is to have special centers or headquarters in the brain, which through the efferent and afferent nerve channels will remain constantly in touch with the brain, for whose existence and protection the brain is responsible. This great protective act will be done in the following manner.

The afferent nerve fibers generally carry to

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the brain S.O.S. calls in the form of pain. For instance, when a foreign matter enters the body structure and interferes with its function, conscious pain, or unconscious pain — as during sleep or faint — notifies the brain of the presence of the intruder. Instantly a help call is received at a particular center in the brain, where in the twinkling of an eye it is decided whether to retain and use this foreign matter or to discard it — and the organ in trouble acts accordingly.

For instance, if an unfriendly body enters the delicate organism of the eye — a help call is sent to its headquarters in the brain.

I may mention here that the senses such as sight and smelling have a direct nerve communication with the brain. These organs, as I told you before, developed outward from the brain. The S.O.S. call of the eye in trouble does not therefore pass through the spinal cord, but goes directly through the optic nerve to the sight centers in the brain.

If the brain decides to relieve the eye, it will proceed to do this in various ways. Firstly, the blood supply around the eye will be greatly increased, raising the temperature of the zone

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in danger; this perhaps for the purpose of burning up the intruder, as well as the unfriendly elements — the bacteria — which might have come with the speck of dust.

Secondly, the glands around the eye will be ordered to create and discharge a fluid, which will either dissolve or wash out the foreign body. You say — "tears begin to run."

Then the muscles of the eye will begin to forcefully expand or contract; twitching the whole mechanism until the foreign body is expelled. As long as pain messages — S.O.S. calls — are sent to the brain, the protective act or the battle of defense will be kept up until a decisive point is reached.

Sometimes when this protective system cannot effect the expulsion of the foreign body, for the time being the enemy is interned. Little epithelial cells come and form a bag around the foreign body to prevent its escape into other parts of the body. For instance, localized pus and sometimes other foreign elements are found imprisoned in separate bags made of delicate membranes.

Generally only harmful elements send pain messages to the brain. Friendly visitors give

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rise to pleasant sensations. For instance, a tasty morsel or the sight of a beautiful object creates a pleasant pattern in the brain. After satisfying the particular sense, the sensation is tucked away within the boundaries of memory, from where it may be recalled at the pleasure of the individual.

I do not wish to give you the impression that when I am born my brain will be thus equipped to meet at once all the different requirements of the adult life. But when I come, I will bring with me this great system complete in its physical form. Every brain-cell or nerve-cell will be there to be gradually connected with the energy-producing centers.

At birth they will be in semi-slumber, gradually to be awakened and stimulated as their services are needed. Physical needs, environment, experience, schooling, training and education will do this for me. The amount of the functionating power of each brain-cell will depend on the amount of stimulus received. Inspiring environment, useful education, will render highly active and productive brain-cells. However, over-stimulation caused by over-training, over-education, excessive physical

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or mental work as well as prolonged disease will cause the destruction and death of a great many brain-cells.

Unlike other cells of the body, which during life increase by self-division, the brain-cells cannot reproduce themselves, so that when one or more of these life batteries are destroyed or disabled no new ones will replace them. In other words, no brain-cells are formed after birth.

It frightens me to think of the limitations of these life batteries. They may not last me into old age — or I may use up too many before I have adjusted myself to my surroundings and have learned to walk, to talk and obey my elders. My heart sinks when I think of all the S.O.S. calls that will be sent to the brain when the extremities of my parents painfully clash with my anatomy.

I hate to think of the battles my precious brain-cells will have to fight with the terrible forces of measles, whooping-cough and other such visitors of childhood, especially the one that has come into prominence in the recent years. They call it "Infantile Paralysis." It is perhaps, at the present time, a

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child's worst enemy, because it attacks first of all the main nerve channel in its defensive system — the spinal cord — and for the time being, and often forever, severs all communication with the body-police-force — the brain. The victim becomes not only defenseless but also partially paralyzed for life.

It is a comfort to hear that infancy and childhood possess a large reserve corps of brain-cells which are not used in everyday life of a child, so that when through disease a number of brain-cells are exhausted, there are others to be stimulated to take up the duties of the lost ones. Therefore, a child recuperates more easily and in a shorter time from an illness than an adult who has already exhausted his reserve corps of brain-cells. In him no brain-cells will be found to take up the work of the ones gone. Thus the adult notices more acutely the reduction of energy.

This idea may somewhat define the process of growing old. After a certain age, when the reserve corps of brain-cells have all been called to active service and a large number have been killed when on duty, the budget of energy of that individual is reduced, either through overwork,

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FIG. XX. — BRAIN CELLS AT REST, IN ACTION, EXHAUSTED. (Crile.)

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worry or disease, which sooner or later cross everyone's path. Finally the day comes when the individual has not a sufficient number of brain-cells to supply the necessary energy to carry on the work of the heart and the lungs. They are forced to give up their life work — death results.

Sometimes a large number of those life batteries are suddenly exhausted. For instance, during fright. The individual, if the incident has not proved fatal, will experience intense feeling of fatigue — perhaps to a fainting point, brought forth by the sudden fatigue of a large number of brain-cells. Generally a period of complete rest only will be the means of recharging these cells, otherwise they will die and disappear.

According to Dr. G. W. Crile, a great authority on the brain-cells, the difference between a fatigued and exhausted brain-cell is that an exhausted brain-cell whose main structures, nucleus and nucleolus, have been torn to pieces and destroyed, can never be recalled to life. A fatigued brain-cell, still possessing its main parts, can regain its former functionating power through systematic rest. Figure XX.

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Therefore, rest and vacation is not to be considered a luxury to be enjoyed by a few fortunate ones, but a great necessity for all people who lead an active life. If occasional periods of rest and regular hours of sleep for the purpose of rejuvenating the fatigued energy-producing centers are not enjoyed by the individual, the budget of energy will soon be diminished to such a degree that the individual will fall a victim of disease or at least will be unable to further lead an active, a useful and a happy life.

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FIG. XXI. — COMPANIONSHIP OF TWINS. (De Lee.)

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CHAPTER XI

TWO SECRETS

SINCE my arrival at the uterus I have been more or less anxious to find out whether there is another occupant here besides myself. A twin sister or a twin brother would have pleased me very much. At times I did imagine I could feel another being leaning against me as twins generally do. Figure XXI.

Even my mother has had similar desires and suspicions. I believe she has already investigated all popular theories which are supposed to reveal this secret to a prospective mother long before the time of birth of her infant. But, alas, this secret is still hidden from her.

Now that I am big enough to reach and feel all around me, I am convinced that my mother will have to be disappointed this time. I shall be born alone.

Unfortunately twins, triplets, quadruplets, and quintuplets are not common with human beings. Twins occur perhaps once in 90 cases;

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triplets once in 8000; quadruplets once in 800,000; quintuplets once in 41,000,000 births. I was not ambitious enough to wish to be one in so many millions, but I did wish to bring with me one other baby, just for a companion to play with.

I am rather disappointed myself that another little ovum did not slip into the same Graafian follicle — my outer shell — when I was an ovum. If this had taken place and both ova had been fertilized about the same time, I am sure I would have had a twin brother or a twin sister to bring with me.

Sometimes it also happens that a daughter cell accompanies the mother cell and they are found and fertilized by two spermatozoa at the same time. The resulting little ones generally look very much alike. Sometimes even their own mother finds it difficult to distinguish them until they begin to show temperamental differences.

It has been said also that sometimes the two halves of the one fertilized cell, in the early stage of segmentation, separate and develop into two separate beings, giving birth to two babies of the same sex — two boys or two girls.

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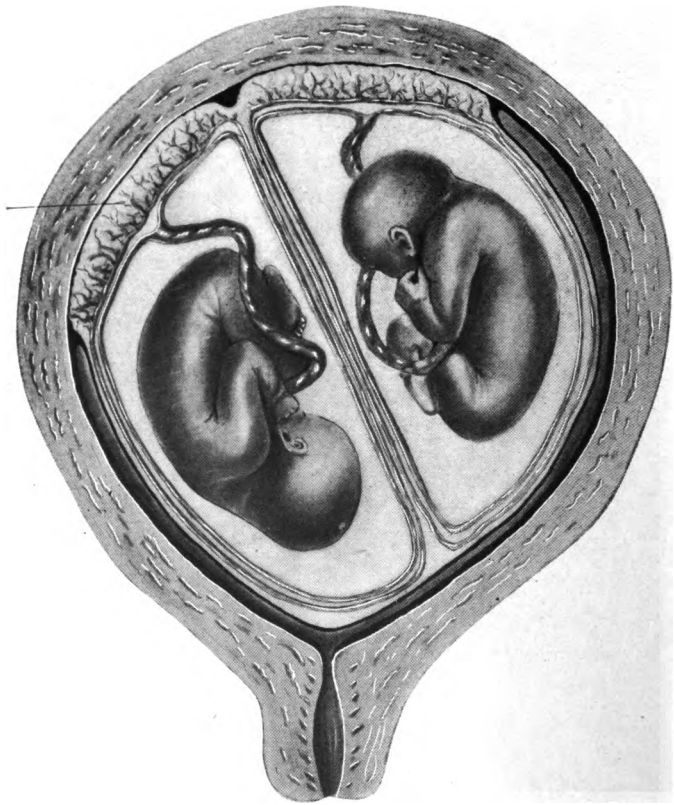

FIG. XXII. — TWINS IN THE UTERUS. (De Lee.)

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Twins resulting from different ova generally develop in the same chorion — Figure XXII — side by side in sweet companionship — still not interfering with each other's separate development. It is very unusual that one of the twins takes advantage of the temporary helplessness of the other and deprives it of the necessary nourishment. When this happens, of course one of them falls a sacrifice to the other. Fortunately such greed is of extreme rarity in our "world of the unborn."

Another incident which is not very common, but unfortunately does happen, in spite of the fertilization of an ovum in the normal manner, is that the embryonal area may divide itself at one or the other end, and in that half-divided form may go through the process of development. The resulting infant then is apt to be a double-headed monster. This when only the upper end of the embryonal area happens to be divided. When the lower end is split the baby will probably have two pairs of legs but one head.

Happy am I that I escaped such an accident. It is strange that *too many* organs are just as undesirable as *too few*. If all goes well with

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me to the time of birth, I hope to bring with me the conventional number of the various organs, each properly shaped and well placed.

The most interesting secret buried in my birth seems to be my future sex. How many, many times have I felt my mother's delightful inquisitiveness. I suppose all prospective mothers, and their friends as well, do their utmost to guess — "Is it going to be a boy or a girl?" "Which would you prefer?" Many similar inquiries have I heard. I see that I must answer this question as well, while I have undertaken to tell the story of my birth, before I am born.

My sex was revealed to me when I was already an embryo. The internal sex organs began to develop long before, but the external signs came about the third month.

I am happy to be a boy, because your world seems to be revolving around manhood. Women are considered to be incidents, no matter how important a part they may play in the bringing and upkeep of life.

It is difficult to say just how I happened to be a boy. The decision was made apparently long before I was I. Some embryologists of

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your world maintain that the sex of a being is decided in the first days. Other scientists say that this question of sex is decided by the experiences of the spermatozoon during its maturation.

Each spermatozoon is said to contain 47 chromosomes — color granules — while the ovum has 48. As I have told you, during maturation half of each cell contents perishes. Hence the mature male sexual cell may possess either 23 or 24 chromosomes — depending on which half is retained — while the mature ovum possesses 24.

When the ovum is fertilized by a spermatozoon containing 24 chromosomes, the resulting embryo is said to be a female. If the spermatozoon with 23 chromosomes undertakes the act of fertilization, the baby will have the male sexual characteristics.

This up-to-date theory, as well as the old story of Adam's rib, gives a female child more to start with — one more chromosome — one more rib. Why is it then that when they grow up into women and men the former are considered to be physically as well as mentally inferior to the latter?

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According to either theories in the creation of living beings, God must have been partial to the female sex. He took one rib or one chromosome from the male and gave it to the female. In other words a girl receives from nature a surplus in starting capital. But when she becomes a woman she is said to fall back, physically and mentally, and henceforth she is known as the "weaker sex." It is evident that she loses her birthright somewhere and sometime in her development. Why do you then blame Nature for her shortcomings?

If you are a man, and truly believe in the inferiority of women, blame man-made forces that control her training, education and bringing up. No other but one of these agents cruelly robs the women folks of their apparently inherited superiority. According to the science of embryology the weaker sex by birth or nature is not the female sex but the male — the result of only 23 male and 24 female chromosomes, instead of 24 male and 24 female chromosomes, which is supposed to give birth to a female being.

When I am born and have become a man I shall surely not try to press the point of my

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physical superiority. I know that in physical endurance no man could measure up favorably with his mother. If you do not agree with me, ask your family doctor — he knows.

Still somehow I was happy to be a boy, measuring already 3½ inches in length when I was three months old.

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CHAPTER XII

HOW MY BODY WAS ADORNED

LITERALLY speaking, "I had the big head" when I began my fourth month. The disproportionate growth of my brain-chamber made the head equal in size to the whole bulk of the main body — the trunk. But considering the number and importance of the organs it contained, one can hardly believe it to be large enough to hold them all.

The face part was relatively small, but at that time it was the proud possessor of all the permanent features of a human being. Also the extremities had already separated from the body and were well divided up. Figure XXIII.

The hands and feet were well developed. Even the fingers and toes, which were at first webbed, were by that time normally articulated and separated, giving each hand five fingers and each foot five toes.

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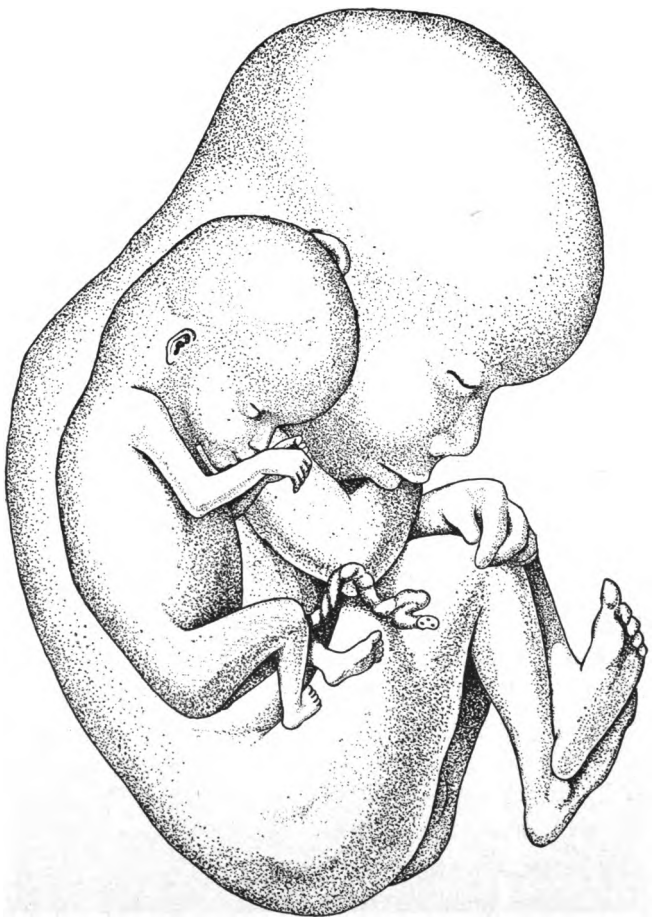

FIG. XXIII. — EMBRYO OF 11 WEEKS, AND FETUS OF 17 WEEKS.

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Again I was grateful to my Maker for this careful division of the hand, so that the conventional number of five was not overstepped. You might think a sixth finger would be quite an additional help, but it is not so. The supernumerary one generally is not an independent finger like the rest, but a part of one — usually a mate to the thumb or the little finger — so that it is greatly in the way.

Another happy incident, which had already taken place by the fourth month, was the complete disappearance of my tail — an embarrassing heritage from my remote ancestors. But at that time all of it was well buried within the tissues of that neighborhood.

Thus when the question of my species was irrevocably decided upon, I was given by the scientists of your world a new name. Henceforth they called me "Fetus" — offspring. If I had been consulted on the matter, I am sure I would have preferred to retain my former name, "Embryo," which I had grown to like because it sounded so "petite" and so loving.

The new name "fetus" sounds Latin — a dead language — not popular among the people of your world, I hear. I don't understand

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why they gave me such a name, when the embryologists themselves do not change theirs.

However, it seems that I have to bear that name until the time comes when I am born and my parents give me a permanent name. I hope that name, which I shall have to bear all through life, will be the true product of the country I am to call my "country." It is a pity that a great country, like the one to be mine, is filled with names founded on stolen or borrowed roots from dead countries and gone people. It seems to me it is time that there should be invented names which stand for American liberty and democracy for American boys and American girls to live up to. Such a one I would wish to bear.

The latter months of my fetal life shall be devoted to my perfection, adjustment and also to the adornment of my body.

Mother Nature seems to take a great deal of time to beautify, as well as to provide further for the protection of my body. Layers and layers of tissues are being built by the cells of the Ectoderm to protect the countless organs from harm. In fact every structure, be it muscle, nerve or bone, has a protective

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covering of its own. Every organ is in a separate bag. Some even — like the kidneys — are placed in chambers well padded with fat. Every organ seems to be provided with different self-protective agents. Yet, I hear few of them go through life without being seriously damaged.

There seems to be a great lesson in the fact that at no time during the remarkable construction of my body is beauty sacrificed for utility. But they are so combined that one never can tell for which purpose any one feature is primarily intended. Think of the skin, the hair or nails. They all are for my protection as well as for the adornment of my body.

Since my very beginning the faithful little cells of the Ectoderm have been busy forming the outer skin composed of many, many layers. It gives to the body a rosy and delicate human hue, besides protecting it from disease and harm.

All channels which shall remain in open communication with the outer world are being lined with "mucous membrane," which is also to form a pleasing edging to the openings. As the color of mucous membrane is a dark red, it adds a great deal to the general appearance

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of an opening such as the lips. What a fortunate and charming thought of nature!

The red hue of the protective membrane is due to the large number of blood vessels contained in it. Such a collection of capillaries on the cheeks are well acceptable, but on the forehead they would be considered as a "birth-mark." Hence I must see that the painting of red is done where it can add to the beauty of my external form.

It is pathetic to think that mothers often accuse themselves of such accidental birth-marks. For instance, if the red patch caused by the misplacement of the capillaries resembles in its form and color a strawberry, it is said to have formed through the unquenched desire of the mother for strawberries during the period of expectant motherhood.

The effect of such a superstition must be terrible both on the mother and later on the grown-up son or daughter. It is true that a mother and child-in-the-being lead a most intimate life, but in no way can the emotional or mental life of the mother retard, arrest or even influence the physical development of her infant.

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For additional protection and charm some cells have already formed little solid cylinders which are sprouting all over me. With the exception of very few areas, these hairs are to cover the whole exterior. Some are to grow rapidly in length; others are to remain short and invisible.

The hairs, which are to assist the scalp and the skull in the protection of that vital and delicate organ — the brain — from dangers that arise from excesses in temperature of the atmosphere, began to come by the fifth month. I understand they are to keep my brain cool in warm countries and comfortably warm in cold climates.

The hairs forming my eyelids and eyelashes, besides their esthetic value, are to prevent foreign elements from entering the precious organs of sight.

Around each hair cell — hair follicle — there are little groups of cells which are to secrete an oily substance to keep the root of each hair clean, moist and soft. They are the sweat glands. At certain regions where there is more hair, they will be more numerous.

The color of the hair depends on the color

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chromosomes, which were the victors in the first battle, when the pattern of my future life was drawn. I notice that in my case chromosomes carrying dark haired tendencies were the victors. My scalp is already covered with little dark hairs.

However, there is a little area right over my ear which is showing a large number of very light hairs, strikingly different from all the others. Does this mean that some color granules bringing light-haired tendencies survived the first battle and were deposited at this region to develop with the dark hair follicles? Whatever the reason may be, I am suspiciously certain that this one spot has not received as much pigment or color substance as the rest.

Hence I am to be born with a light patch of hair on the one side of my head. The friends of my mother will surely call it a "birthmark." My parents may not be quite satisfied with this part of the great creative work within me.

But it seems to me that such a birthmark is not quite as offensive looking as moles on the face, which are also due to the misplacement

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of the original pigmented or colored hair follicles. Unfortunately such stray hairs, like weeds, grow rapidly and are often accompanied by a number of color cells forming a ring around such a hair colony.

It is remarkable that this beautifying feature of the human body — the hair — can be so disfiguring if it appears where Nature did not intend it to be, and where it is absolutely useless.

Other beautifying as well as useful structures which owe their existence to the cells of the Ectoderm are the nails. Every finger and every toe is supplied with a nail by the fourth month to help them in the performance of their great work.

When the fingers were well divided from each other some of the cells of Ectodermic origin came closer together and formed a dense but thin plate at the end of each finger. At first they were small, soft and almost invisible, but by the fifth and sixth months they had developed into real nails and were well protruding over the finger tips.

Thus the last three months of my fetal life are devoted to the completion of the various

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organs and especially to the beautifying and modeling of my exterior. Mother Nature seems to be busy pushing in here, pulling out there, adding little beautifying touches everywhere.

The growth of some parts was for the time being retarded so that others could grow up to the required size and establish a pleasing proportion among all the members of the human body. For instance, my head was asked to stop growing after the fifth month so that the neck part could have a chance.

The arms, which about the third month were very much longer than the legs, had to wait until the legs had grown proportionately. Also a little painting was done by Mother Nature. But as my eyelids are still closed I am unable to say much about the coloring of my eyes, which was decided during the great act of maturation of each primary cell and later in the act of fertilization. It will be interesting to see just which color granules survived the first battle of life.

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CHAPTER XIII

THE EVIDENCES OF LIFE BEFORE BIRTH

UNTIL recently the wiser and more enlightened men of your world who no longer were satisfied with the story of the creation of man as told in the first chapters of the Bible thought we little fetuses spent most of our precious days and equally valuable nights in a continuous "dreamless sleep."

This is not altogether true. We do sometimes sleep. But such a period of rest always and necessarily follows a longer period of physical and often even mental activity. It may be true that a vague and an obscure will intervenes in the production of all our body actions; but it is also a fact that I can already differentiate between friendly and unfriendly influences and interventions.

I kick with as much force as I can spare at the time when I suspect the presence of an unfriendly element about me. When I was only 15 or 16 weeks old I could flex and extend my head or withdraw my hands and feet when

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they were touched. At any time I can change the strained position of my body into one more comfortable.

It was the mystery of these early body movements which disturbed the peace of mind of my mother. Fortunately they also aroused her curiosity and made her feel more hungry for true knowledge regarding my coming. These movements, called by you "Quickening," can be felt, heard and even seen through the abdominal wall by every mother, provided the wall is not too thick, as it is in the case of fat women.

There is hardly an intense thought or feeling crossing the mind and soul of my mother which is not felt by me, although they in no way do or can interfere with the great work; but I am somehow aware of the character of her thoughts as well as her actions.

I try to share her periods of work and rest as much as I can, but sometimes it is not possible for me to change from one into the other as rapidly as she does. Therefore, at times my continued activity and movements disturb her when she has already gone to sleep. Often she is disturbed by my body efforts to

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obtain a more comfortable position or to escape the pressure exerted on me by her overloaded intestines. Otherwise we live in perfect harmony and companionship.

Even the different systems are not inactive all during these months. But as soon as they were installed, they began to devote just so much time of each day for practice and tuning up. A great many body motions, especially those of my extremities, are performed just to practice each muscle for its future particular task, whether it be to pull, to stretch or to support.

The respiratory system has begun to do mock-movements at regular intervals. The respiratory actions can be felt and even heard by an attentive observer. This of course is not accompanied by the regular inhalation of air, but it is performed only to strengthen and prepare the mechanism of the diaphragm and the chest for the function of future respiration.

My primitive heart began its great work of preparedness soon after the formation of the main chambers. Since then fetal pulsation may be felt with little difficulty through the abdominal wall of my mother.

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My nervous system was alertly on the watch very early. It would not allow any outside force or foreign body to interfere with the great creative work within me. As soon as the outer openings of the main channels — the digestive or respiratory tubes — were formed, and foreign elements tried to enter my body, this remarkable protective mechanism — the nervous system — would somehow effect gently or forcefully the expulsion of the intruder.

, For instance, the fluid about me, called Amniotic fluid, seems to possess the great desire to pass into my mouth and from there to enter the digestive tube. Fortunately my self-protective system will not stand for it. The nerves of the larynx immediately begin to contract and forcefully expand until most of the troublesome fluid is thrown off. Such "hiccoughing" is of daily occurrence. In fact lately I have been hiccoughing a great deal. Sometimes it may seem to my mother I hiccough just for the fun of it.

In the last two months, since the little fingers came, I have been very much amused by the way they can bend and open. I must confess that sometimes I spend happy hours

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just sucking them. This is to tune up the sense of taste, often at the expense of the finger. My right thumb is really swollen. I hear mothers dislike to see such a fad among us children. Hence I shall try not to put my thumb into my mouth the minute I am born, like that infant who was seen by Dr. A——, an eminent obstetrician of recent years.

All my other senses are also in perfect preparedness and full of life. If I were to be born during the seventh month, my sense of sight will surely recognize light from darkness. I am sure even then I would turn my face toward the light if I were brought in contact with light. I know I should make a wry face if a solution of quinine were placed on my tongue. You will see that very soon after I am born I will be able to distinguish cow's milk from my mother's own milk. Fortunately my whole mechanism possesses wonderful powers of adaptation. I can get used to cow's milk if it has to be for the sake and comfort of my mother.

Don't you once believe that I shall not know the difference between my father and the attending doctor. My nose will tell me soon who is who. Of course I shall have my

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eyes to help me in this matter. But my sense of smell, perhaps due to the more frequent usage of my remote ancestors, will be more advanced and more active at birth than my sense of sight. This fact will be demonstrated if I be born a month or two before the normal time.

Every cell is already alert and ready to take up its work whenever it is given the opportunity. Of course it will be a little while, even after my birth, before all forces within me are in perfect harmony with those I find in your world — but I am sure you will see when I come that I am pretty adequately prepared to take up the duties of living as I may find them in this twentieth century — my time.

I can think of no one body act that will be absolutely new to me. Even my sound apparatus — the larynx and the vocal cords — I have used to make little sounds. I wonder if my mother ever heard me? Some mothers have reported having heard their little ones murmur, when still tucked away under their hearts.

When I began to communicate with my mother, my talking apparatus was not ready

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to help me in my intercourse. Therefore I had to use my extremities, making jerky motions until her soul and my soul met in silent communion.

Since that glorious day we have needed no sounds to hear and understand each other. As soon as she closes her eyes, excluding distractions from without, I can make her think what I wish her to think. In her soul she hears me speak, though I am absolutely silent. Her thoughts are so different during such dreams of motherhood that she is convinced that I am the speaker and she the listener.

Thus — this little narrative came to be.

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CHAPTER XIV

AN EXPLANATION AND A PLEA

As the day is approaching when this chapter of my life will close, to open the next in a world of joys and sorrows, hopes and realities, I cannot help but let my mental eyes wander to that world which is soon to be mine. Oh, how wide is that wide, wide world, yet how narrow to them who are bound down to one custom, to one idea. Men and women — they all seem to be slaves of custom, fashion and man-made and man-enforced laws.

As I focus my eyes on your world, I see that cities are nothing but gigantic beehives, where money is the queen and the countless drones are struggling, crushing each other to have a glimpse of that irresistible mistress of man.

Now I can understand why so much thought and energy was spent in the fortification of my body and mobilization of my self-defensive forces. In that gigantic chaos I shall certainly

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need all my native tools of *self-defense* — but God grant no other.

Wrongly it has been said that the human being is the only animal born without a weapon. I may be the most helpless vertebrate at birth, but I shall be equipped with a weapon which has no equal. *I will possess a human voice,* not one that spells words of a language, but one that is inarticulate but more expressive and a thousand times more impressive. In your parlance you call it "crying."

Who can resist an infant's prolonged crying, especially if delivered with will-power and temperament?

In my immediate helplessness I shall become quite powerful through the effective use of my sound apparatus. I am told that an infant is safe as long as it can make itself heard. No normal being, man or beast, can resist the forcefulness and soulfulness of an infant's cry. In fact a child can obtain almost anything he wants if he knows how to cry for it.

I am told that a great many homes are ruled more or less by the youngest member of the family, who through experience has learned to appreciate the power of its own cry-

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ing. It takes an average child a few days to detect this weapon and become quite efficient in its use. In a few weeks a normal infant fully masters all the required tunes and modulations.

Judging from the cry of a three months' old baby it possesses all the varieties of emotions and is also conscious of all its physical needs. It can tell when it is physically uncomfortable, hungry, thirsty, too warm, too cold or when suffering from pain. Through volume and modulation of its cry, a child may describe the character and intensity of its needs.

Who cannot differentiate between the cry of an infant who is suffering from colic and the one crying because of the pain caused by the sticking of a pin? How different is a hungry cry from a sleepy cry!

In the first few months I shall do one of two things. I shall cry when I am not asleep, or I shall sleep when I am not crying. In that early period of infancy a child is not able to remain awake and enjoy the pleasures of your world, for it takes all of that time and more to adjust and tune its various mechanisms and systems to the demands of the new world. Therefore it sleeps or leads a negative life.

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It only wakes up when in need of some assistance; hence its crying.

Unfortunately in the recent years we have been misunderstood by most so-called "educated" parents. They have mistaken our self-defensive crying for an offensive attack on them. We have no intentions of spoiling the bliss of young domestic happiness. Our cry is nothing but a help call.

One of the reasons, perhaps, why we are often misjudged is the fact that in the early months of infancy no tears accompany the act of crying. The young parent looks at the crying infant and says — "He is not crying, he is just naughty." It may help us perhaps if such parents were told that in the early months of infancy the tear glands (purposely) are not sufficiently developed to furnish tears for the effectiveness of crying. (Otherwise many a home would be flooded.)

It seems to be apparent that our cry has lost some of its power over most highly civilized people — in fact a terrible fad is sweeping over them. Everybody but the grandmother preaches to a young mother with a first-born, "Let the baby cry out, it is good for its lungs."

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It is surprising how readily an educated mother becomes a victim of that modern disease called "up-to-date-itis," which is caused by the bacteria of half knowledge and ill-advice. These deadly germs gnaw on the delicate bands of love that exist between mother and child and forever sever the bond of sympathy between them.

Mother love comes with the birth of the infant, but child love to its mother and father must be called into being and must be cultivated by untiring helpfulness and cherished by happy companionship (without "don'ts"). Otherwise it is exhausted long before the young one reaches the age of boyhood and girlhood, when love and respect to one's parents are the only safety valves against the evil currents of temptation which flood the life of every normal man and woman.

It was only a few days ago when I was given an opportunity to find out whether my mother belonged to such civilized and far advanced people, whose pity is not to be reached by our help-calls and pleadings. A neighborly grandmother was calling on her to take counsel and to advise in her grandmotherly sweet way.

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She was anxious to know whether my mother, like her two married daughters, who were also graduates of distinguished colleges, intended to disrespect her baby's cry and deny it all old-fashioned expressions of mother love, or whether she would go to the assistance of the little one in need — regardless of the hour and the day's program.

Oh, how happy I was to hear my mother promise to respond to my call. "I don't want my baby to develop a cry habit," she said; "that is the mother-germ of temper."

Still I am afraid from what I hear from the spirits of other children who were born before me that I shall have to use my weapon — my voice — very often in those advanced days when so much of our comfort is sacrificed for the sake of "looks and appearances."

They tell me that as soon as I am born the claws of fashion will take hold of me and will bundle me up in blinding snow-white robes of various thicknesses, sizes and shapes. I shall be tucked away in a narrow shining white bed, as tightly as possible, between layers and layers of smelly and starchy covers and ribbons. There I am expected to stay until next "feed-

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ing time." The length of that uncomfortable period shall depend on the notions of the attending doctor and nurse, neither truly nor seriously interested in the ultimate man, — I, — in the future.

From two to four hours at a time I shall thus be forced to retain the unnatural position given to me. Under the circumstances surely breathing will be most difficult. With each inhalation of air my tender and inexperienced lungs will have to lift up all those gowns, ribbons and covers that have been piled on me and around me by the cruel and commercial fashion and fad.

Will you blame me then if I cry for help and only then fall asleep when I can cry no more? I wonder how my lungs are supposed to benefit from such a sad and exhausting experience! My mother is right when she says that such prolonged crying can develop nothing but *temper* (a most undesirable attribute, appreciated by no one and justly despised by every one in the world).

Every mother must be held responsible for the presence of temper in her child. Surely it could not have developed in the peaceful

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life it led before birth. Perhaps if every up-to-date mother could be made to lead the life we infants have to live for a few days, she would soon see the folly and cruelty of her new ideas in regard to the bringing up of her infant.

I wish every mother could spend a day on Riverside Drive. She would be surprised to see how many white-gowned nurses, wheeling white perambulators with snow-white babies within, wear dark-colored goggles. This because the whiteness all about them is actually painful to their eyes!

Who dare estimate the extent of the harm such glaring whiteness everywhere does to the children's more delicate eyes! All through infancy and childhood the pupils of these fashionable children are thus forced to remain contracted and the eyelids blinking, in an effort to diminish the number of strong light rays that radiate from glaring white objects everywhere about them.

I often wonder why we children must be deprived of the pleasure that may be derived from the beautiful hues of other colors. Give us colors; give us sounds and smells; give

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us the world as we shall find it when our wings have grown. The period of infancy and childhood is *the* time when all our senses should be tuned to the demands of adult life.

Give us love as it bubbles out from the tender mother-heart — even if it has to be expressed by undue shaking and tossing about of our delicate anatomy. Our bones are soft; they do not break so easily; but our affections are hard — they have to be warmed up and softened.

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CHAPTER XV

MY BIRTH TO YOUR WORLD

THE nine busy months are over. To-morrow I am to be born. The short space of time between this insignificant to-day and that great to-morrow is holding perhaps the most memorable event in my coming life — my birth to your world.

To-morrow shall be the day which will remain in the memory of my people to be remembered to their old age either with joy or with sorrow and regrets. It is going to be a remarkable day, for no event in my life could possibly have more consequences than my birth.

The most remarkable feature of this act is the fact that from the moment I am born the attitude of all people toward me will completely change. To-day, while yet a fetus, I am thought to be a mere parasite, living on my mother, giving her nothing in return. But as soon as I am born I shall be considered an independent personality, and because of

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my sex, automatically all the rights of citizenship will be invested on me. I shall not have to beg or fight for them in later years.

Yet to-day I am only a sweet but an unspeakable secret. To-morrow my existence and my arrival will be heralded among many people. To-day good form and good manners have barred me from the conversation of all well-bred people. To-morrow I shall be the only proper and interesting topic of their verbal intercourse. To-day only my mother takes me seriously and considers me in her actions. To-morrow I shall rule every member of her household. I will be the only one allowed to be heard and they all will surely and gladly obey my call. These and many more remarkable changes will be the consequences of my birth.

In bare facts this incident consists mainly in my changing of temporary dwelling place. I leave my home within the body of my mother, which nature had prepared for me, and enter the home of my parents. Of course such an occurrence necessarily affects somewhat my mode of living.

You may wonder just how I am to come to

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your world. My departure and my arrival is just as simple as any one's going and coming in your world. When I feel I am ready to depart, I order the assembling of my household. Soon the outer envelope is dislodged and completely separated from the walls of the hospitable uterus of my mother. This separation of the ovum from the maternal tissues is the first notice given to the uterus that the fetus is in reality not a part of itself, but a temporary tenant — a foreign body. As soon as the uterus grasps this idea it begins to refuse to harbor it any longer. All forces available are then utilized to bring about the discharge of the ovum.

The walls of the uterus begin to contract, first gently in ten or fifteen minute intervals. (Naturally such forceful contractions cause acute pains to the mother.) Gradually the contractions become more violent and more frequent, until the outer membranes of the ovum are unable to withstand the pressure exerted on them by the maternal walls. They break and the child is expelled. The child's advent may be considerably facilitated by the free flow of the "waters" or amniotic fluid.

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Soon after the successful birth of the infant the rest of its household appears. The after-birth consists of the different fetal membranes and the placenta. Sometimes it happens that only the chorion — placenta — ruptures, but the amniotic bag remains intact, so that the little infant is born with a "Caul" — "in a veil" — which is considered to be a sign of great luck. This accident is apt to happen when the uterine contractions are not strong enough to break this part of the shell of the ovum. It is unnecessary to state further that it is only a mechanical accident and can have no significance in the life of that individual.

Its only attachment to the protective fetal membranes — the umbilical cord — is then severed by the attending physician, who also generally assists the new-born baby to take in its first breath of air. The air fills its lungs; the excess air is discarded through the larynx. When the volume of air comes in contact with the vocal cords, the baby's first cry is effected, which is usually the first audible expression of a new life.

Under normal conditions this act of being born, known as labor, is accomplished in a

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few hours' time. But I am sorry to hear that unfortunately normal labors with normal births are growing fewer as civilization progresses, perhaps due to the present mode of living of mothers — their form of dress and occupation during and prior to the period of motherhood. Heredity and disease tend to produce unfavorable conditions, which make our birth very difficult and extremely painful to the mother. It has been said also that the evolution of the head, due to the increased mental capacities of the race, has made normal births almost impossible.

Knowing all these unfavorable conditions, I must make special effort to make the act of my coming as easy for my mother as it is possible. Evidently I have very little to say in this matter, as I am to be only the object of birth — the passenger. The duration and the character of labor will depend on the powers which are to accomplish my transportation or expulsion, and also on the conditions of the passage — the cervix — and the interference I may encounter.

Generally one differentiates three periods of labor.

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In the first period the ovum separates from the uterus.

In the second period the membranes break and the infant is delivered.

In the third period the after-birth is discarded.

Though I am to be unable to obviate much of the pain to be experienced by my mother, still at all times I shall endeavor at least not to make things more unbearable for her. I will try to assist nature whenever the opportunity presents itself. For instance, the position of the child during the second stage plays an important part in the character of birth. Head presentation seems to be most advantageous. Hence I shall do my best to let my big head pass first through the narrow passage. The rest, I am told, will easily follow.

It will be terrible to let a disfiguring incident take place after all the months of care and labor to make my body well proportioned and pleasing to look at. When I first meet my mother and perhaps also my father, I shall like to see them well pleased and well gratified for their efforts toward my coming.

I wonder whether they will approve of my sex? I think mother will be pleased to see

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me a boy, as all the little garments she has so lovingly prepared are adorned with little blue ribbons. This is supposed to be the color for boys. Why? I shall ask her as soon as I can do so.

Before that to-morrow is at hand I want to throw a last look on myself. How happy I am to see that the great creative work is completed. All the internal and external organs are well placed and ready to take up their life work.

The eyelids are now separated — I can open and close them at will. The protective eyelashes and eyebrows are also there, though hardly recognizable. A great deal of the unnecessary hair has fallen off. It is only there where it should be. For instance, the hair on my head is several inches long but unfortunately of various shades. As far as I can see at present that light streak of hair is the only birthmark I am taking along. Considering the great number of more serious types of disfigurements I escaped, I shall not complain, and hope my people will take a similar view on that only birthmark.

The nostrils and the mouth are open; the

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tongue is free and able to move about. I had to swallow many mouthfuls of the fluid about me just to make the tongue flexible and keep it in good practice. I think it is quite able now to take up swallowing, and with a little patience and practice it will be able to fulfill its other equally valuable duty — which is to assist in the expression of my wants and later also of my thoughts. (I hope to have some.)

The ears have moved upward, I am happy to say, and are open, so that they will be able to transmit to me my mother's and my father's first loving words.

My extremities are well formed and the finger tips have each a nail to assist in their work.

In short, I am ready to take up life and to battle with its problems as they may present themselves. Figure XXIV.

Hark, orders for my removal have gone out. I hurry to close my story. And here ends the first chapter of my life and the story of my birth.

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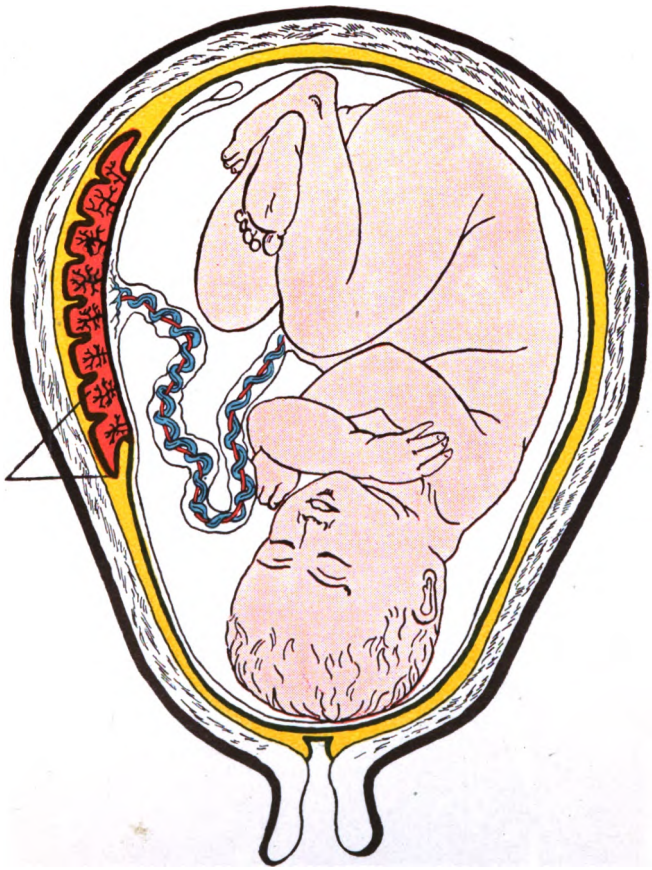

FIG. XXIV. — FETUS AT FULL TERM. (Ahlfeld.)

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The Healthy Baby

THE CARE AND FEEDING OF INFANTS

By ROGER H. DENNETT, M.D.

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This work makes clear to the mother just how to do best the ordinary, everyday things that every mother has to do for her child. The author believes that there is a definite need for a book which will describe in the minutest detail the daily care of the baby. The description or treatment of any but the simplest ailments has purposely been left out, because a book of this sort which attempts in any way to describe disease does more harm than it does good. A well-trained physician or a specialist in children's diseases finds it difficult enough at times to diagnose the different affections, and it only confuses the mother or nurse to describe the different diseases to her.

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Dr. Dennett is a well-known physician in New York City and is also a writer of reputation, his page in the *Woman's Home Companion* called THE HEALTHY BABY having made him the *friend* of mothers throughout the land. What he has to say, therefore, on such subjects as appetite, clothing, the bath, teeth, milk, the mixing and care of the food, and food for traveling is certain to secure wide attention. His book is divided into six parts, considering, respectively, Development and the Bodily Functions, Hygiene and Treatment, Common Ailments, Care of the Special Organs, Feeding and Diet, and Lists.

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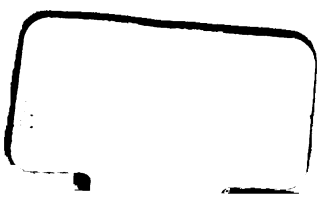

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